SLV-M20HF

RMT-V250

SERVICE MANUAL

US Model
Canadian Model

Hi-Fi

VHS

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT Ⅵ for MECHANICAL ADJUSTMENTS. (9-921-647-11)**

S MECHANISM

SPECIFICATIONS

System

Format
VHS NTSC standard
Video recording system
Rotary head helical scanning FM system
Video heads
Double azimuth four heads
Video signal
NTSC color, EIA standards
Tape speed
SP: 33.35 mm/s (1 3/8 inches/s)
EP: 11.11 mm/s (7/16 inches/s)
LP: 16.67 mm/s (11/16 inches/s), playback only
Maximum recording/playback time
8 hrs. in EP mode (with T-160 tape)
Fast-forward and rewind time
Approx. 3 min. (with T-120 tape)

Tuner section

Channel coverage
VHF 2 to 13
UHF 14 to 69
CATV A-8 to A-1, A to W, W+1 to W+84
Antenna
75-ohm antenna terminal for VHF/UHF

Inputs and outputs

LINE-1 IN and -2 IN
VIDEO IN, phono jack (1 each)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN, phono jack (2 each)
Input level: 327 mVrms
Input impedance: more than 47 kilohms
LINE OUT
VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO OUT, phono jack (2)
Standard output: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms
S-LINK (CONTROL S IN)
Mini jack (1)
CABLE BOX CONTROL (CONTROL S OUT)
Stereo mini jack (plug in power) (1)
CPD IN
Mini jack (1)
G-Link
Mini jack (1)

Timer section

Clock
Quartz locked
Timer indication
12-hours cycle
Timer setting
8 programs per month (max.)
Power back-up
Built-in self-charging capacitor
Back-up duration: up to 1 hour at a time

General

Power requirements
120 V AC, 60 Hz
Power consumption
24 W
Operating temperature
5 °C to 40 °C (41 °F to 104 °F)
Storage temperature
– 20 °C to 60 °C (– 4 °F to 140 °F)
Dimensions
Approx. 430 × 107 × 287 mm (w/h/d)
Approx. (17 × 4 1/4 × 11 3/8 inches) including projecting parts and controls
Mass
Approx. 4.6 kg (10 lb 2 oz)

Supplied accessories

Remote commander (1)
Size AA (R6) batteries (2)
75-ohm coaxial cable with F-type connectors (1)
Audio/video cable (3 phono, 1 mini to 3 phono, 1 mini) (1)
Monaural cable (1-mini to 1-mini) (1)
Cable Mouse (cable box controller) (1)
Jack cover (1)
SmartFile labels (5)

Design and specifications are subject to change without notice.

VIDEO CASSETTE RECORDER

MICROFILM

SONY

[NOTE ON REPAIRING HARNESSES BETWEEN AN-16/17 BOARDS AND MG-21 BOARD]

AN-16 board CN201 ◄——► MG-21 board CN002
AN-17 board CN101 ◄——► MG-21 board CN001

Be sure to use the original one or equivalent (AWG, length).
If not so, the resonance frequency will be changed.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

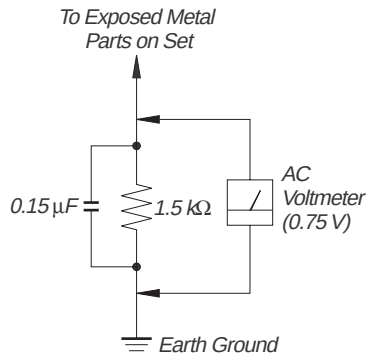

Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA TW-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

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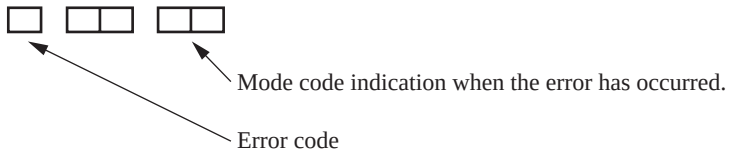
SERVICE NOTE

1. ERROR CODE INDICATION

- Error codes are indicated using the lower 5 digits in the fluorescent display tube.
  "At this time, Colon ":" between character is not indicated."



ERROR CODE

0	No error
1	Cam encoder error Loading direction
2	Cam encoder error Unloading direction
3	T reel error
4	S reel error
5	Capstan error
6	Drum error
7	Error on initializing
8	Cassette loading error
9	Reserve

MODE CODE

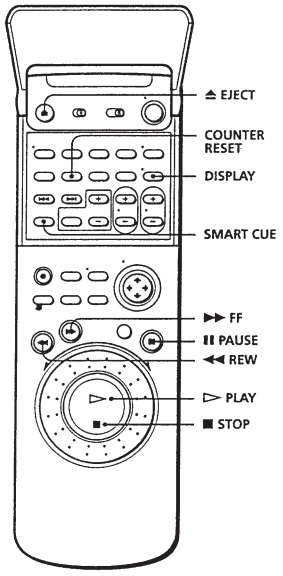
0	Power-on eject	10	FWD x1	20	REW play
1	Power-on initial	11	FWD x2	21	Cas. loading
2	Power-off eject	12	CUE	22	Tape loading
3	Power-off stop	13	PB-pause	23	Power-off loading
4	FF	14	RVS-pause	24	Mecha. error (Power on)
5	REW	15	RVS x1	25	Power-on eject initial
6	REC	16	RVS x2	26	Power-off eject initial
7	REC- pause	17	REV	27	APC REC
8	Power-on stop	18	Power-off initial	28	Cas. loading
9	PB	19	Mecha. error (Power off)		(No auto PB check)

SECTION 1
GENERAL

This section is extracted from instruction manual.

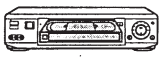
Playing a tape

You can play back both VHS and S-VHS tapes on this VCR. However, you cannot obtain the original resolution quality of S-VHS (simplified playback).



1 Turn on your TV and set it to the video channel.

2 Insert a tape.



The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.

3 PLAY

Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	⏏ EJECT

To skip playback

You can skip a portion of playback you don't want to watch such as a commercial and restart playback by pressing a single button.

1 Press SMART CUE during playback of the scene you want to skip. The VCR starts searching.

2 Press SMART CUE again when you find the scene you want to watch. The VCR stops searching, rewinds a few seconds, then resumes normal playback.

If you press and hold SMART CUE while the VCR is skip searching, the VCR will stop searching, and continue rewinding until you release SMART CUE.

Tip

- You can change the length of rewinding time on the ADVANCED OPTIONS menu. See page 35.

To use the time counter

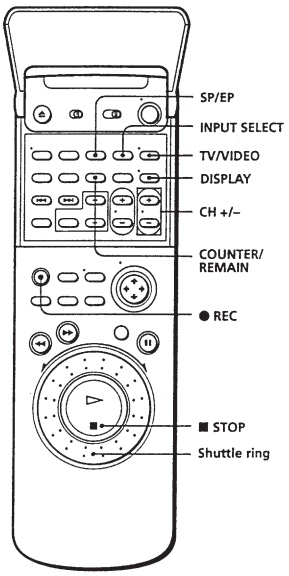
At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.

To display the counter on the TV screen, press DISPLAY.

Notes

- Tapes recorded in LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

Recording TV programs



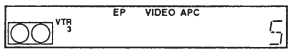
1 Turn on your TV and set it to the video channel.

To record from a cable box, turn it on.

2 Insert a tape with its safety tab in place.

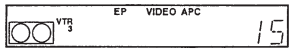
3 INPUT SELECT

Press INPUT SELECT until a channel number appears in the display window.



4 CH

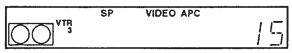
Press CH +/– to select the channel you want to record.



5 SP/EP

Press SP/EP to select the tape speed, SP or EP.

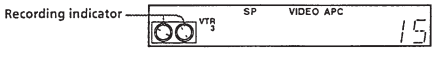
EP (Extra Play) provides recording time three times as long as SP (Standard Play); however, SP produces better picture quality.



6 REC

Press ● REC to start recording.

The recording indicator lights up red in the display window.



To stop recording

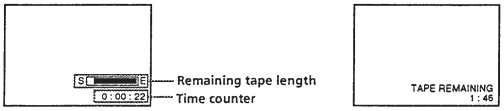
Press ■ STOP.

continued

Recording TV programs (continued)

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining. With the display on, press COUNTER/REMAIN to check the remaining time. Each time you press COUNTER/REMAIN, the time counter and the remaining time appear alternately. The remaining time with the ⏲ indicator also appears in the display window.



To check the remaining time of a T-140 or T-180 tape, set TAPE SELECT in the ADVANCED OPTIONS menu to "180." (For details, see page 35.)

To watch another TV program while recording

1. Press TV/VIDEO to turn off the VIDEO indicator in the display window.
2. If the TV is connected to the VCR's LINE OUT jacks, set the TV to TV input; if not, skip this step.
3. Select another channel on the TV.

To select a channel using the shuttle ring

To select a channel in step 4 above, you can also use the shuttle ring. During stop, turn the shuttle ring clockwise for higher channels or counterclockwise for lower channels. The VCR switches the channel in the preset order.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.

Tips

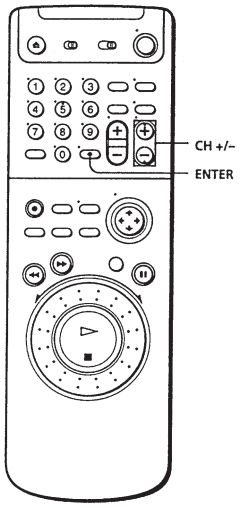
- To select a channel, you can use the number buttons on the remote commander. Enter the channel number, then press ENTER.
- You can select a video source form the LINE-1 IN or LINE-2 IN jacks using INPUT SELECT.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV. When using a cable box, make sure to leave it on.
- You can set the channel with the shuttle ring during stop. However, you cannot set the channel with the shuttle ring on the remote commander when:
  - you set CABLE MOUSE in the CABLE BOX CONTROL menu to ON.
  - you press JOG so that the remote commander is in jog mode.

Notes

- The remaining time may not be indicated accurately for short tapes such as T-20 or T-30, or tapes recorded in LP mode.
- The display does not appear during still (pause) mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining time after you press DISPLAY.

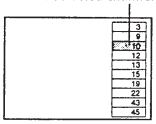
Locating a channel using the channel list

You can select the TV program from the channel list.

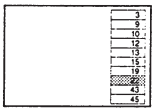


1 Turn on your TV and set it to the video channel.
When using a cable box, turn it on.

2 • ENTER Press ENTER.
The channel list appears on the TV screen.

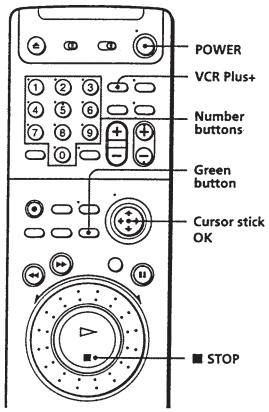


3 • CH Press CH +/– to select the channel you want.



4 • ENTER Press ENTER.

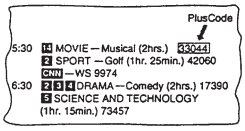
Recording TV programs using VCR Plus+

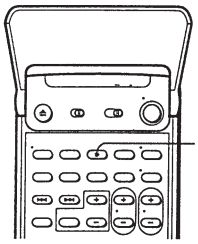


How VCR Plus+ works

Whenever you want to record a TV program, all you need to do is look up the program's "PlusCode," a number assigned to each program published in the TV section of most newspapers, cable TV listings, and even TV GUIDE magazine. Then, just enter the PlusCode of the program you want and the VCR is automatically programmed to record that show. It's that simple.
You can preset up to 20 programs with the GUIDE Plus+ timer for recording and/or viewing at one time.

Example of "PlusCode"


PlusCode
5:30 14 MOVIE—Musical (2hrs.) 43044
2 SPORT—Golf (1hr. 25min.) 42060
CNN —WS 9974
6:30 2 3 4 DRAMA—Comedy (2hrs.) 17390
5 SCIENCE AND TECHNOLOGY
(1hr. 15min.) 73457



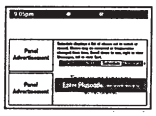
Before you start...

- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel. When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- If you insert a tape with the SmartFile function, make sure the total recording time doesn't overlap any protected programs. For details about the SmartFile function, see pages 52 through 53.

1 VCR Plus+

Press VCR Plus+.

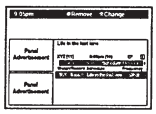
When the Channel map selection menu appears on the TV screen, you have to select the channel map of your area. For details on how to select the channel map, see "To select the channel map" on page 59.



2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪ • CURSOR PUSH OK

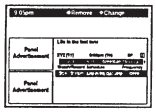
Press the number buttons to enter the program's PlusCode, then press the cursor stick (OK).

The date, start time, program name, and recording pattern appear on the TV screen. The program is set to be automatically recorded in EP mode.



3 SP / EP

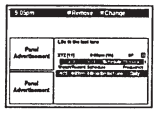
Press SP/EP to select the tape speed, SP or EP.



4

Press the green (Change) button repeatedly to select Once, Daily, or Weekly:

To record	Select
Only once	Once
Everyday Monday to Friday	Daily
Once a week	Weekly



5 • POWER

Press POWER to turn off the VCR.

The ⏲ indicator appears in the display window and the VCR stands by for recording. When using a cable box, leave it on.

continued

Recording TV programs using VCR Plus+ (continued)

To stop recording

To stop the VCR while recording, press ■ STOP.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press POWER. The ⏲ indicator turns off and the VCR switches on. Remember to press POWER to reset the VCR in timer recording standby after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV program.

To lock the VCR after setting the timer (Child Lock)

While the VCR turns on, hold POWER down on the VCR until the 🔑 indicator appears in the display window. The VCR turns off and the 🔑 indicator remains lit. The VCR will not work except for timer recording.

To unlock the VCR, hold POWER down on the VCR until the 🔑 indicator disappears from the display window. The VCR is unlocked and turns on.

To stop timer recording while the VCR is locked, press ■ STOP. The recording stops and the VCR is unlocked.

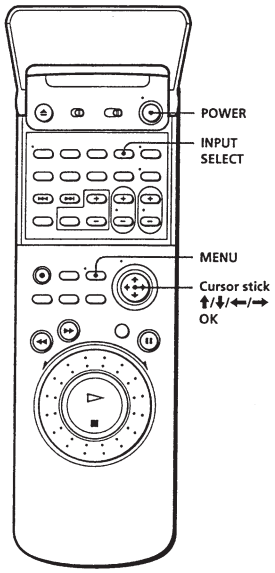
Tip

- To cancel VCR Plus+ recording, see "Canceling a VCR Plus+ or GUIDE Plus+ recording or viewing schedule" on page 71.

Notes

- If the VCR doesn't accept the PlusCode, this means that the PlusCode is incorrect.
- You cannot select Daily or Weekly for a program that airs more than seven days ahead.
- The VCR will be unlocked when:
  - you stop timer recording by pressing ■ STOP.
  - you insert a tape.
  - the AC power cord is disconnected or power supply stops.

Setting the timer manually



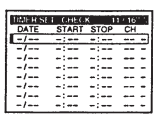
If VCR Plus+ and GUIDE Plus+ are not available in your area, follow the instructions below to set the timer to record programs. You can manually preset up to eight programs at one time not including those of VCR Plus+ and GUIDE Plus+ recording.

Before you start...

- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel. When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- If you insert a tape with the SmartFile function, make sure the total recording time doesn't overlap any protected programs. For details about the SmartFile function, see pages 52 through 53.

1 • MENU

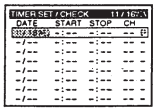
Press MENU and select TIMER SET/CHECK.



continued

Setting the timer manually (continued)

2 Set the date, start and stop times, channel number and tape speed:



• CURSOR

PUSH OK

1 Push the cursor stick to ➡ to highlight each item in turn.
2 Push the cursor stick to ↓/↑ to set each item.

To correct a setting, push the cursor stick to ⬅ to return to that setting and reset.

To record the same program every day or the same day every week, push the cursor stick to ↓ while the date is highlighting. For details, see "Daily/weekly recording" on the next page.

INPUT SELECT

To record from a source connected to the LINE–1 IN or LINE–2 IN jacks, press INPUT SELECT to display "LINE1" or "LINE2" in the "CH" position.

3 • CURSOR

PUSH OK

Push the cursor stick to ➡ to confirm the setting.

The cursor appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4 • CURSOR

PUSH OK

Press the cursor stick (OK).

5 • POWER

Press POWER to turn off the VCR.

The ⏻ indicator appears in the display window and the VCR stands by for recording.

When using a cable box, leave it on.

Daily/weekly recording

In step 2 above, push the cursor stick to ↓ to select the recording pattern. Each time you push the cursor stick to ↓, the indication changes as shown below. Push the cursor stick to ↑ to change the indication in reverse order.

the current date → SUN-SAT → MON-SAT → MON-FRI → EVERY SAT ..... → EVERY MON → EVERY SUN → 1 month later → (date counts down) → the current date

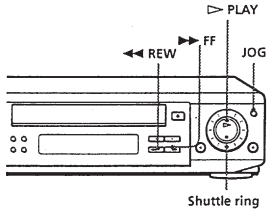
Tips

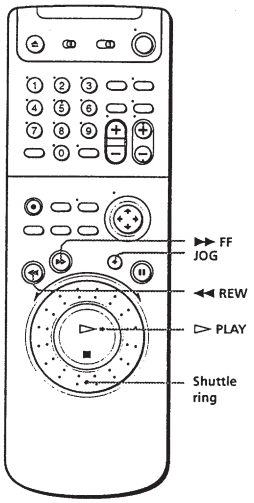
- To set the channel, you can also use the CH +/– or number buttons.
- You can set the channel with the shuttle ring during stop. However, you cannot set the channel with the shuttle ring on the remote commander when:
  – you set CABLE MOUSE in the CABLE BOX CONTROL menu to ON.
  – you press JOG so that the remote commander is in jog mode.
- To set the tape speed, you can also use the SP/EP button.
- When you are recording a program in SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to EP mode. Note that some noises will appear on the picture when the tape speed is changed. If you want to keep the same tape speed, set AUTO TAPE SPEED to OFF in the ADVANCED OPTIONS menu (page 35).
- To lock the VCR after setting the timer, see page 14.

Note

- If you are using cable box control, you cannot select "LINE1" or "LINE2."

Playing/searching at various speeds





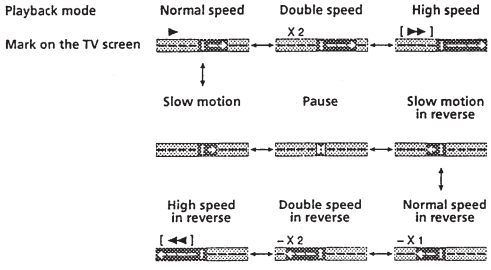
Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold ▶▶ FF down. During rewind, hold ◀◀ REW down.
Search forward	Press ▶▶ FF during playback.
Search backward	Press ◀◀ REW during playback.
Rewind and start play	During stop, hold ◀◀ REW on the VCR, and press ▷ PLAY on the VCR.

Using the shuttle ring

With the shuttle ring, you can operate a variety of playback options. There are two ways for using the shuttle ring, normal mode and jog mode.

To use the shuttle ring in normal mode

During playback or pause, turn the shuttle ring clockwise or counterclockwise. Each change in the shuttle ring position changes the playback mode, and the corresponding mark appears on the TV screen for a few seconds in the following way if the on-screen display function is on:



To use the shuttle ring in jog mode

Use this mode for frame-by-frame playback.

Press JOG to enter jog mode. The JOG button lights up. If you change to jog mode during any playback mode, the playback pauses so you can see a still picture. Each change in the shuttle ring position shifts the picture one frame. To shift frames in reverse, turn the shuttle ring counterclockwise. The frame shift speed depends on the speed you turn the shuttle ring. To resume normal playback, press JOG again. The JOG indicator goes off.

To resume normal playback

Press ▷ PLAY.

continued

Playing/searching at various speeds (continued)

Tip

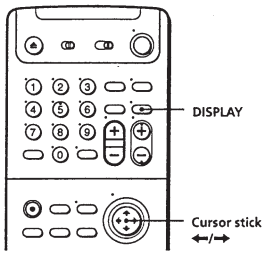
- Adjust the picture using the TRACKING +/– buttons if:
  - streaks appear while playing in slow motion.
  - bands appear at the top or bottom while pausing.
  - the picture shakes while pausing.

Notes

- The sound is muted during these operations.
- Tapes recorded in LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The picture may have snow:
  - when playing at high speed in reverse.
  - when playing in reverse slow motion.
  - when playing in reverse.
- If the playback mode mark doesn't appear on the TV screen, press DISPLAY.
- The picture may flutter a bit when playing in slow motion.

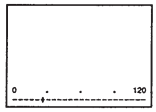
Searching for a selected point on the tape

You can easily find a specific point by moving the pointer on the TV screen. The VCR fast-forwards or rewinds to the point you indicate and starts playback automatically.



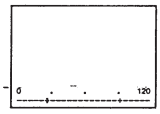
1 Press DISPLAY repeatedly until the bar indication appears on the TV screen.

A cursor (▮) indicating the current position of the tape appears on the bar indication. If the cursor does not appear, play the tape a few moments (by pressing ▷ PLAY, ▶▶ FF or ◀◀ REW) until the cursor appears.



2 Push the cursor stick to ←/→ to move the pointer (+) to the point where you want to start playback.

The VCR starts searching and the cursor (▮) moves toward the pointer. When the VCR locates the marked point, playback starts.



To cancel searching

Press ▷ PLAY or ■ STOP.

To turn off the bar indication

Press DISPLAY again.

continued

Searching for a selected point on the tape (continued)

Notes

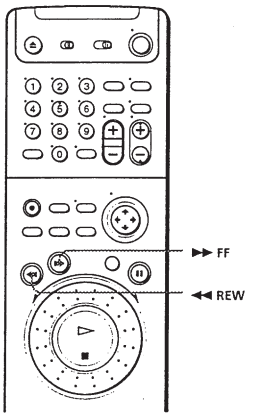
- The figure on the bar indication represents the total time length of the inserted tape as shown below.
  The total time length may not be displayed correctly for:
  - tapes other than T-60, T-120, or T-160
  - tapes recorded in more than one tape speed mode.

Tape type	Total time length		
	SP	LP	EP
T-60 or shorter	60	120	180
from T-80 to T-140	120	240	360
T-160 or longer	160	320	480

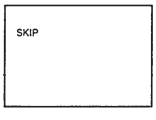
- If you move the pointer (+) on the bar indication during search, the VCR searches for the new reset point.

Skip-searching automatically

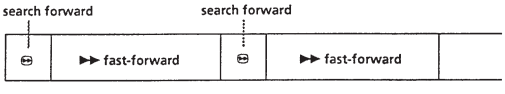
You can spot check a whole tape quickly. At intervals, the VCR skips playback while searching forward or backward.



Press ▶▶ FF (or ◀◀ REW) for more than two seconds during stop. "SKIP" appears on the TV screen.



The VCR searches forward (or backward) for about two minutes on the counter, then fast-forwards (or rewinds) for about ten minutes on the counter. The VCR repeats this operation until it stops at the end (or beginning) of the tape.



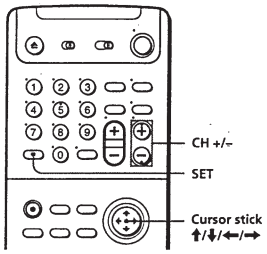
To cancel skip-search

Press ▷ PLAY or ■ STOP.

Note

- The VCR automatically fast-forwards (or rewinds) any portion with no recording.

Creating a favorite channel list



You can create your favorite channel list from the TV channels. You can store up to 10 channels and select the channel from your favorite channel list.

Before you start...

- Turn on your TV and set it to the video channel. When using a cable box, turn it on.

Creating your favorite channel list

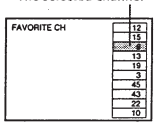
1 Press SET.

The FAVORITE CH screen appears on the TV screen.

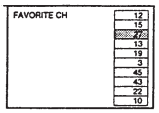
2 Press CH +/– to select the channel you want to replace.

You can also use the cursor stick (↑/↓) instead.

The selected channel



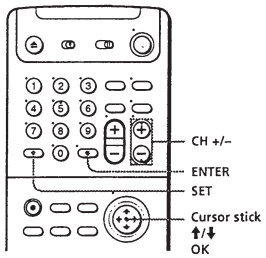
3 Push the cursor stick to ←/→ to select the channel you want to set.



4 Repeat steps 2 and 3 to set the channels as required.

5 Press SET.

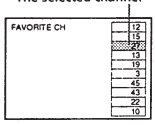
Selecting a channel from your favorite channel list



1 Press SET.

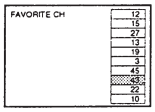
Your FAVORITE CH screen appears on the TV screen.

The selected channel



2 Press CH +/– to select the channel you want to select.

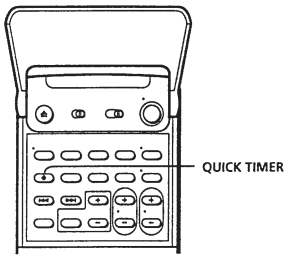
You can also use the cursor stick (↑/↓) instead.



3 Press ENTER.

You can also use the cursor stick (OK) instead.

Recording TV programs using the quick timer



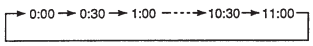
After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.

1 While recording, press QUICK TIMER once.

The ◴ indicator appears in the display window.

2 Press QUICK TIMER repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.



The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

To stop while recording

Press ■ STOP.

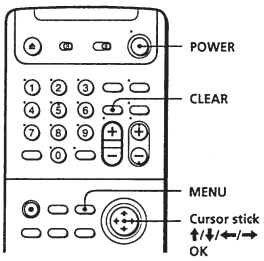
Using the quick timer during stop mode

1 Press QUICK TIMER.

2 Press CH +/– or INPUT SELECT to select the channel you want to record.

3 Press QUICK TIMER repeatedly to set the recording duration.
The recording starts.

Checking/ changing/ canceling the manual timer settings

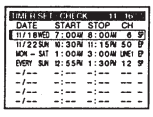


Before you start...

- Turn on your TV and set it to the video channel.

1 Press POWER to turn on the VCR.

2 Press MENU and select TIMER SET/CHECK:



- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press the cursor stick (OK), then turn off the VCR to return to recording standby.

3 Push the cursor stick to ↑/↓ to select the setting you want to change:

- To change the setting, push the cursor stick to ←/→ to highlight the item you want to change, and push the cursor stick to ↑/↓ to reset it. Then, push the cursor stick to → repeatedly until the cursor appears at the beginning of the line.
- To cancel the setting, press CLEAR.

4 Press the cursor stick (OK).

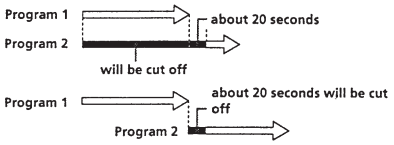
If any timer settings remain, turn off the VCR to return to recording standby.

continued

Checking/changing/canceling the manual timer settings (continued)

When the manual timer settings overlap

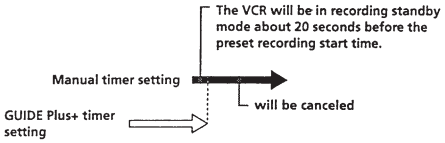
The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



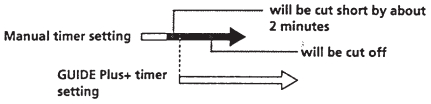
When the manual timer setting and the GUIDE Plus+ timer setting overlap

When the manual timer setting and the GUIDE Plus+ timer setting (including VCR Plus+ recording) overlap, the GUIDE Plus+ timer setting has priority. If you want to make more than one timer setting at one time, we recommend that you use the same timer setting method at that time for all timer settings, either the GUIDE Plus+ timer or the manual timer setting.

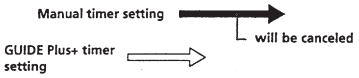
- If the recording stop time of the GUIDE Plus+ timer setting and the recording start time of the manual timer setting are set at the same time, the manual timer setting is canceled.


The VCR will be in recording standby mode about 20 seconds before the preset recording start time.
Manual timer setting
will be canceled
GUIDE Plus+ timer setting

- If the manual timer setting and GUIDE Plus+ timer setting are scheduled to start at the same time, the VCR starts recording the program preset with the GUIDE Plus+ timer.
- If the GUIDE Plus+ timer setting is scheduled to start while the VCR is already recording a manual timer setting, the VCR stops recording the manual timer setting and starts recording the GUIDE Plus+ timer setting. If the recording stop time of the manual timer setting and the recording start time of the GUIDE Plus+ timer setting are set at the same time, the VCR stops recording of the manual timer setting about two minutes before the preset stop time.



- If a manual timer setting is scheduled to start while the VCR is recording the GUIDE Plus+ timer setting, the manual timer setting is canceled.



Recording stereo and bilingual programs

Recording stereo programs

This VCR automatically receives and records stereo programs. When a stereo program is received, the STEREO indicator lights up. If there is noise in the stereo program, set AUTO STEREO in the ADVANCED OPTIONS menu to OFF. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 34.

Recording bilingual programs

Normally, this VCR records only the main sound. Whe SAP (Second Audio Program) is received, the SAP indicator lights up › record only SAP sound, set TUNER AUDIO in the ADVANCED OPTIONS menu to SAP. For details, see page 34.

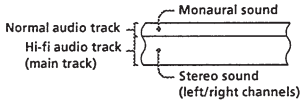
Selecting the sound during playback

Press AUDIO MONITOR to select the sound you want. (The sound being recorded will not change.)

To listen to	On-screen display	Display window
Stereo/main (left and right channels)	STEREO	STEREO
Left channel only	LEFT CH	STEREO
Right channel only	RIGHT CH	STEREO
Monaural	No indicator	No indicator

How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.

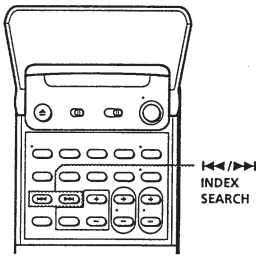


Notes

- To play a tape in stereo, you must use the A/V connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the ADVANCED OPTIONS menu is set to OFF.

Searching using the index function

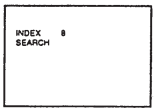
The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position.



1 Insert an indexed tape into the VCR.

2 Press I◄◄ /►►I INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:

- To search ahead, press ►►I INDEX SEARCH.
- To search backwards, press I◄◄ INDEX SEARCH.



The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts automatically from that point.

To stop searching

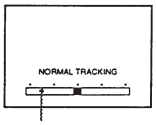
Press ■ STOP.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the ▨ indicator flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. In this case, manually adjust the tracking.

Press the TRACKING +/– buttons to display the tracking meter. The distortion should disappear as you press one of the two buttons (the ▨ indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



Tracking meter

About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the ADVANCED OPTIONS menu (with the APC indicator in the display window lit). For details, see page 35.

APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

Notes

- Auto tracking adjustment cannot be guaranteed to work with tapes recorded in LP mode on other VCRs.
- The APC function does not work if the tape speed is automatically changed from SP to EP mode during a manual timer recording, unless the tape has been recorded in EP mode with the APC function.
- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyze the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately.

  If you want to start recording quickly without using the APC function, first set the VCR to recording pause (the APC indicator flashes slowly) and press ❚❚ PAUSE to start recording.

Changing menu options

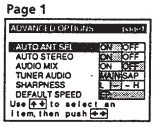
1 Press MENU and select ADVANCED OPTIONS.

2 Push the cursor stick to ↑/↓ to select the option to change, then push the cursor stick to ←/→ to change the setting.

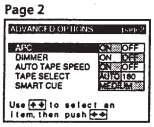
The ADVANCED OPTIONS menu has 2 pages. To select page 2, push the cursor stick to ↓ repeatedly until page 2 appears. To select page 1, push the cursor stick to ↑ repeatedly until page 1 appears.

3 Press the cursor stick (OK) to return to the original screen.

Page 1


ADVANCED OPTIONS
AUTO ANT SEL ON OFF
AUTO STEREO ON OFF
AUDIO MIX ON OFF
TUNER AUDIO MAIN SAP
SHARPNESS L H
DEFAULT SPEED EP
Use ↑↓ to select an item, then push

Page 2


ADVANCED OPTIONS
APC ON OFF
DIMMER ON OFF
AUTO TAPE SPEED ON OFF
TAPE SELECT AUTO 180
SMART CUE MEDIUM
Use ↑↓ to select an item, then push

Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
AUTO ANT SEL	**ON** if your TV is connected only to VHF/UHF OUT on the VCR. To play a tape, set the TV to the VCR channel (channel 3 or 4). OFF if your TV is connected to both VHF/UHF OUT and LINE OUT on the VCR. To play a tape, set the TV to the VCR input.
AUTO STEREO	**ON** to receive stereo programs, OFF to reduce noise. The sound changes to monaural.
AUDIO MIX	ON to listen to the sound recorded on hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. **OFF** to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button.
TUNER AUDIO	**MAIN** to record the main sound on both hi-fi and normal audio tracks. SAP to record the SAP (Second Audio Program) sound on both hi-fi and normal audio tracks.
SHARPNESS	L (Low) through H (High) to adjust the sharpness of the picture. L to turn off the sharpness control.
DEFAULT SPEED	**EP** to set the recording tape speed automatically back to EP after recording. SP to set the recording tape speed automatically back to SP after recording. FLOAT to set the recording tape speed to the last position selected from the SP/EP button.

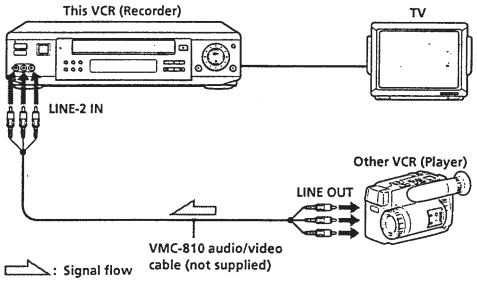
Menu option	Set this option to
APC	**ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality, OFF to switch off APC.
DIMMER	ON to make the display window dim, **OFF** to make it brighter.
AUTO TAPE SPEED	**ON** to change the manual timer recording tape speed automatically to EP mode when the remaining tape becomes shorter than the recording time, OFF to keep the same tape speed.
TAPE SELECT	**AUTO** or 180 (when using a T-140 or T-180) to select the tape length and display the remaining time correctly.
SMART CUE	**MEDIUM** to set the automatic rewinding time on skip playback to a medium length, SHORT to set to short, LONG to set to long.

Notes

- If you set the DEFAULT SPEED option to EP, you can still change the recording tape speed to SP, or vice versa by pressing the SP/EP button only for that program. Next time you record a program, the recording tape speed is automatically set to the position you set in the DEFAULT SPEED option.
- The Auto Tape Speed function doesn't work for the VCR Plus+ and the GUIDE Plus+ recordings.

Editing with another VCR

How to hook up to record on this VCR



How to hook up to a stereo system

Connect LINE-2 IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

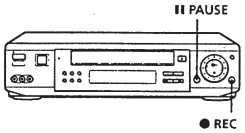
If the other VCR has a CONTROL S OUT jack for synchronized editing

Hook up to record on the other VCR, then connect the VCRs via the CONTROL S jacks. The CONTROL S connection lets you control (pause and release pause) both VCRs from the recording VCR.

Notes

- Make sure you connect the plugs to jacks of the same color.
- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- You can also use the LINE-1 IN jacks instead. If the other VCR is a monaural type, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910MS audio/video cable (not supplied).
- If the CONTROL S IN jack is used for S-Link™ (A/V bus control) with a TV, the CONTROL S connection cannot be used for editing.

Operation (when recording on this VCR)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" or "L1" in the display window.
- Press SP/EP to select the tape speed, SP or EP.

1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press II PAUSE.

3 Press ● REC on this VCR and set it to recording pause.

4 To start editing, press the II PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tips

- To edit more precisely, press the II PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press II PAUSE on this VCR when an unwanted scene begins. When it ends, press II PAUSE again to resume recording (Assemble Editing).

Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyzes the tape. Then when you start recording in step 4, press II PAUSE immediately after the APC indicator stops flashing. If you press II PAUSE before the APC indicator stops flashing, the APC function is canceled.

About the SmartFile function

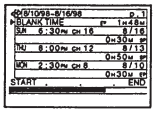
SmartFile* allows you to view the contents of your video tape (recording date, channel, etc.) on the TV screen. It is no longer necessary to rewind, fast-forward, or play back a tape to find out what is recorded. You can also locate and start playback of a specific program, or find the position from which you want to start recording by using this list. Program data is stored in the memory of the SmartFile label attached to the tape.

The following functions are possible using SmartFile:

Recording using the SmartFile function (page 40)

To use the SmartFile function, attach the SmartFile label to the tape. If you record a program on a tape with a SmartFile label, the contents will appear on the SmartFile search list. With the SmartFile list, you can also easily find the beginning of the available recording space.

SmartFile search list

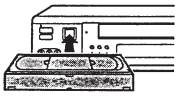


Selecting and playing a program (page 45)

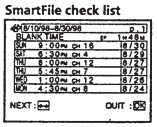
To play back a recorded program, select the program you want to watch using the SmartFile search list. The VCR locates the program and playback starts automatically.

Checking the contents of a tape (page 46)

When you bring the SmartFile label close to the SMARTFILE sensor on the VCR, a summary of the recorded programs appears in the SmartFile check list. It is not necessary to insert the tape into the VCR and press ▷ PLAY to find out what is recorded on it. This feature allows you to easily find the program you want to watch, or to quickly find a tape with enough recording space.



SmartFile check list



* SmartFile is a trademark of Sony Corporation.

Labelling a recorded program and tape (page 47)

You can attach an electronic "label" to the video tape and its programs on the SmartFile list. Labelling the recorded programs enables you to find a program easily when you want to play it back.

Protecting a recorded program (page 52)

You can protect a recorded program from accidental over-recording or erasure.

Erasing the data of an unwanted program (page 54)

By erasing a program from the SmartFile list, the VCR will record over the unwanted program.

Storing program data from the DSS receiver (Program Data Download) (page 55)

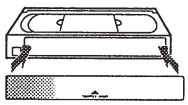
If you connect a DSS receiver equipped with the Program Data Download function, you can store the program and category name transmitted from the DSS on a SmartFile tape. The DSS receiver equipped with the Data Download function will be available in the future.

Recording using the SmartFile function

To use the SmartFile function, attach the SmartFile label to the spine of the cassette tape. If you record a program on a tape with a SmartFile label, program data, such as the program name, category, date, and channel, is automatically stored in the memory of the SmartFile label.

Attaching the SmartFile label to the cassette tape

To use the SmartFile function, attach the supplied SmartFile label to the cassette tape. Remove any stains or dirt from the surface of the spine of the tape. Then, holding both edges of the SmartFile label so that it doesn't bend, attach it along the guide line to the spine of the cassette tape. This tape is henceforth referred to as a SmartFile tape.



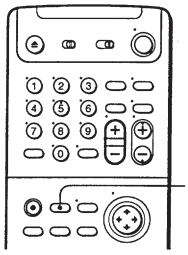
Note on the purchase of SmartFile labels

- **For the customers in the USA**
  To order additional SmartFile labels, see the back page.
- **For the customers in Canada**
  Additional SmartFile labels can be purchased at Sony of Canada Ltd. Authorized VHS Dealers.

Notes

- The SmartFile label is equipped with a memory chip. The memory chip may be damaged and cannot be used when you:
  - twist or fold the SmartFile label.
  - remove the SmartFile label and re-attach it to a tape.
  - attach more than one SmartFile label to a tape.
  - attach some metal, or sticker which has metal, to the SmartFile label.
  - write too strongly on the SmartFile label using a ballpoint pen or similar sharp instrument.
  - disassemble or remodel a label.
- Do not leave the SmartFile label in a place subject to excessive dust or dirt, direct sunlight, humidity, mildew, strong magnetism, or near heat sources.
- If you attach the SmartFile label to a short length tape, such as T-30 or shorter, you cannot use the SmartFile function.

Recording a program on the SmartFile tape

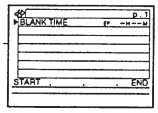


When recording a program on the SmartFile tape, no matter what method you use to record the program (normal recording, VCR Plus+ recording, GUIDE Plus+ recording, etc.), program data (date, channel, recording start time, etc.) is stored in the memory of the SmartFile label. If you record a program using VCR Plus+ or GUIDE Plus+, you can also store in memory the program and category name transmitted from certain TV stations. The SmartFile label can contain up to 12 programs' data. When the number of the stored programs goes over 12, the oldest program data is erased from the SmartFile list. However, a program which lasts less than about 15 minutes in EP mode or about 5 minutes in SP mode cannot be stored in the memory.
When you record a program on the SmartFile tape which already contains program data, see "Recording after locating the Blank Time space" on page 43.

Before you start...

- Turn on your TV and set it to the video channel.

1 Insert a SmartFile tape with its safety tab in place.



The VCR turns on, the SMARTFILE indicator lights up, and the SmartFile search list automatically appears on the TV screen.

2 Press SMARTFILE.
The SmartFile search list disappears.

3 Start recording a program.

Tip

- You can protect a recorded program from accidental over-recording or erasure (see page 52).

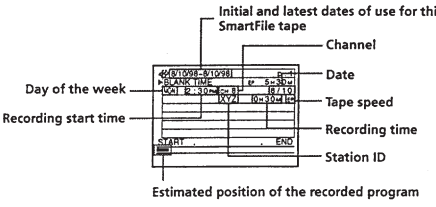
Note

- If you press the ❚❚ PAUSE button one or more times during recording, thereby creating short lengths of recorded time between such pauses, program data may not be stored in the SmartFile label.

continued

To check the information of a recorded program

Press SMARTFILE. The SmartFile search list appears. The recording day of the week, start time, channel, date, station ID, recording time, and tape speed appear on the list. The longest space which doesn't have any program data (Blank Time space) appears as "BLANK TIME."



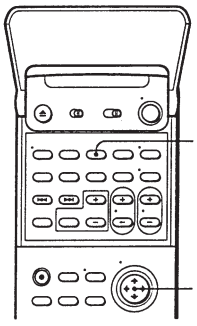
Tips

- When you record a program using VCR Plus+ or GUIDE Plus+, the program and category name may appear on the list instead of the day of the week, recording start time, and channel.
- You can manually label a recorded program and select the category. You can also label the SmartFile tape. See pages 47 through 51.

Notes

- The station ID appears only if the broadcaster sends this information.
- If you don't set the clock or the clock isn't set to the correct time, the recording time won't be stored correctly on the SmartFile list.
- When you record a program using the normal recording mode while the CABLE MOUSE option is set to ON in the CABLE BOX CONTROL menu, the channel number is stored as "CH---."
- When you set the AUTO TAPE SPEED option to ON in the ADVANCED OPTIONS menu, and the tape speed automatically changes from SP to EP during manual timer recording, the VCR displays the entire recording time converted in SP mode to the SmartFile list.
- The recording time length in the SmartFile list is an estimation and may be slightly different from the actual recorded time length.

Recording after locating the Blank Time space

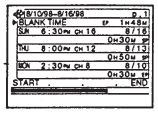


The SmartFile function identifies not only the largest amount of available blank space, but also recorded material that doesn't have corresponding program data stored in the SmartFile label. The longest available recording space (including programs that are not stored on the SmartFile label) is referred to as "Blank Time space." You can locate the beginning of the Blank Time space for recording. If there is a recorded program after the Blank Time space, the VCR will over-record on that program unless you stop recording. If there is a program you want to prevent from being recorded over or erased, protect that program before you start recording another program (see pages 52 through 53).

Before you start...

- Turn on your TV and set it to the video channel.

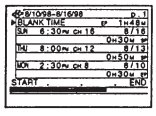
1 Insert a SmartFile tape with its safety tab in place.



The VCR turns on, the SMARTFILE indicator lights up, and the SmartFile search list automatically appears on the TV screen. The Blank Time space appears in the "BLANK TIME" row.

The Blank Time space also appears in the display window.

2 Push the cursor stick to ↑/↓ to select BLANK TIME.



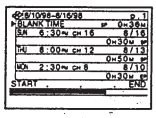
BLANK TIME is on page 1 of the SmartFile search list.

continued

Recording using the SmartFile function (continued)

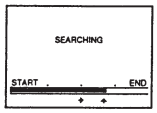
3 Press SP/EP to select the tape speed, SP or EP.

The BLANK TIME changes according to the selected tape speed. Select a tape speed that matches the length of the program you want to record.



4 Press the cursor stick (OK).

The VCR goes to the beginning of the Blank Time space and stops.

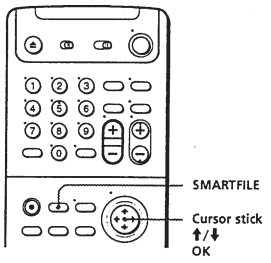


5 Start recording.

Notes

- If a newly recorded program overlaps a stored program, the stored program information is erased from the SmartFile list when:
  - the stored program is over-recorded for more than about 15 minutes in EP mode and about 5 minutes in SP mode.
  - the remaining length of the stored program becomes less than about 15 minutes in EP mode and about 5 minutes in SP mode.
- You may not be able to locate the beginning of the Blank Time space correctly in the above step 4 when:
  - the SmartFile tape contains one or more short length (less than about 15 minutes in EP mode and about 5 minutes in SP mode) recorded programs of which program data are not stored in the SmartFile label.
  - the SmartFile tape is damaged or dirty.

Selecting and playing a program



You can automatically locate and start playback of a program recorded on the SmartFile tape. Select a program in the SmartFile search list. The SmartFile search list can contain up to 12 programs.

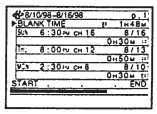
Before you start...

- Turn on your TV and set it to the video channel.

1 Insert a SmartFile tape.

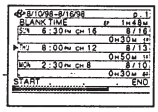
The VCR turns on, the SMARTFILE indicator lights up, and the SmartFile search list automatically appears on the TV screen.

If the SmartFile tape is already inserted, press SMARTFILE.



2 Push the cursor stick to ↑/↓ to select a program.

Pushing the cursor stick to ↑/↓ repeatedly will turn the pages.



3 Press the cursor stick (OK).

The VCR starts searching for the beginning of the selected program. Playback starts automatically from that point.

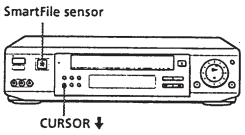
To stop searching

Press ■ STOP.

Note

- You may not be able to locate the beginning of the selected program correctly when:
  - the SmartFile tape contains one or more short length (less than about 15 minutes in EP mode and about 5 minutes in SP mode) recorded programs of which program data are not stored in the SmartFile label.
  - the SmartFile tape is damaged or dirty.

Checking the contents of a tape



You can display the program data list of a SmartFile tape on the TV screen. It is not necessary to insert the tape into the VCR. This feature allows you to quickly find a specific program or to find a tape with enough recording space. The SmartFile check list can contain up to 12 programs.

Before you start...

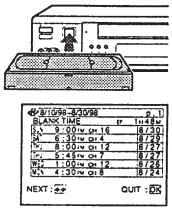
- Turn on your TV and set it to the video channel.

1 Hold the label side of the SmartFile tape close to the SmartFile sensor.

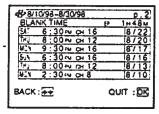
Slowly bring the center of the label within 3 cm of the SmartFile sensor.

There is a short beep, the SMARTFILE indicator lights up, and the SmartFile check list appears.

The Blank Time space also appears in the display window.



2 Press CURSOR ↓ repeatedly to turn the pages.



Tips

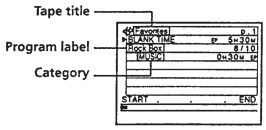
- The SmartFile check list automatically disappears after about three minutes of nonuse.
- If you press a button other than SP/EP or the cursor stick (OK), the SmartFile check list disappears.
- You can turn the pages by pushing the cursor stick to ↑/↓ on the remote commander.

Notes

- You cannot display the SmartFile check list while:
  - you display the SmartFile list of a different SmartFile tape inserted into the VCR.
  - you display any other menu.
- If the SmartFile check list doesn't appear on the TV screen, try again by drawing the SmartFile tape away from the SmartFile sensor at least 5 cm, then bring it back to within 3 cm of the sensor.

Labelling a recorded program and tape

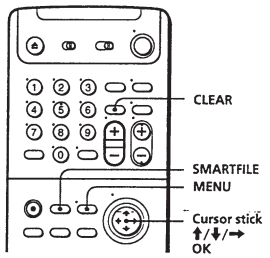
You can electronically "label" a program and select a category, such as SPECIAL or MOVIE, for a recorded program in the SmartFile list. You can also label a tape. Up to 18 characters can be input for a program and tape label.



Labelling a recorded program and selecting a category

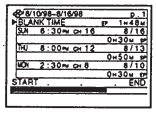
Before you start...

- Turn on your TV and set it to the video channel.



1 Insert a SmartFile tape.

The VCR turns on, the SMARTFILE indicator lights up, and the SmartFile search list automatically appears on the TV screen.



2 Press SMARTFILE.

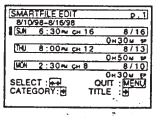
The SmartFile search list disappears.

continued

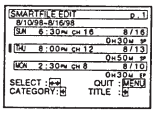
Labelling a recorded program and tape (continued)

3 Press MENU and select SMARTFILE EDIT.

The SMARTFILE EDIT menu appears.

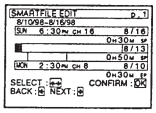


4 Push the cursor stick to ↑/↓ to select a program.



5 Push the cursor stick to →.

The cursor moves to the program label input position.



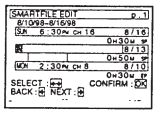
6 Label the program.

❶ Push the cursor stick to ↑/↓ to select a character.

Each time you push the cursor stick to ↓, the character changes as shown below.

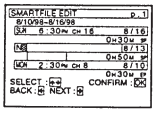
A → B → ... → Z → symbol → 0 → 1 → ... → 9 → a → b → ... → z → (blank space)

If you make a mistake, press CLEAR.



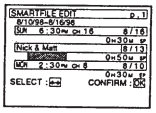
❷ To set the next character, push the cursor stick to →.

The cursor moves to the next position.



❸ Repeat steps ❶ and ❷ to label the program.

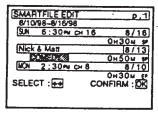
7 Press the cursor stick (OK).



8 Push the cursor stick to ↑/↓ to select a category.

Each time you push the cursor stick to ↓, the category changes as shown below.

SPECIAL → MOVIE → NEWS → SHOW → SPORTS → KIDS → MUSIC → ARTS → SERIES → EDUCATI (education) → HOBBY → SHOPPIN (shopping) → VARIETY → COMEDY → DRAMA → DAYTIME → HOW TO → OTHERS → (blank)



9 Press the cursor stick (OK).

The program label and a selected category are stored.

10 Press MENU.

The menu disappears.

To erase the program label

Press CLEAR after step 4 above. The program label is erased and the recording day of the week, start time, and channel number reappear.

To erase the selected category

Press CLEAR in step 8 above. The selected category is erased and the space becomes blank.

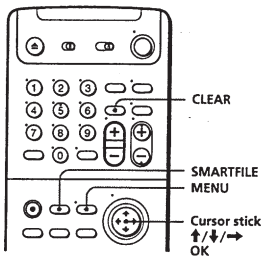
continued

Labelling a recorded program and tape (continued)

Labelling a tape

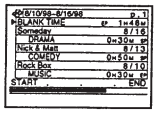
Before you start...

- Turn on your TV and set it to the video channel.



1 Insert a SmartFile tape.

The VCR turns on, the SMARTFILE indicator lights up, and the SmartFile search list automatically appears on the TV screen.

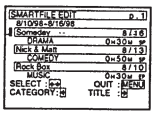


2 Press SMARTFILE.

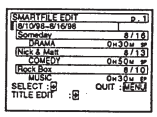
The SmartFile search list disappears.

3 Press MENU and select SMARTFILE EDIT.

The SMARTFILE EDIT menu appears.

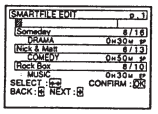


4 Push the cursor stick to ↑ to select the tape title.



5 Push the cursor stick to →.

The cursor moves to the tape title input position.



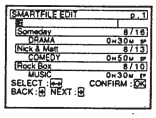
6 Label the tape.

❶ Push the cursor stick to ↑/↓ to select a character.

Each time you push the cursor stick to ↓, the character changes as shown below.

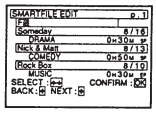
A → B → ... → Z → symbol → 0 → 1 → ... → 9 → a → b → ... → z → (blank space)

If you make a mistake, press CLEAR.



❷ To set the next character, push the cursor stick to →.

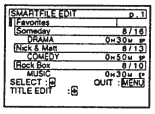
The cursor moves to the next position.



❸ Repeat steps ❶ and ❷ to label the tape.

7 Press the cursor stick (OK).

The tape title is stored.



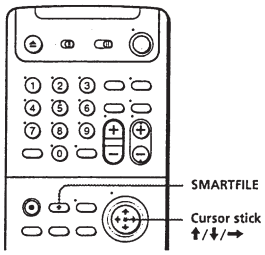
8 Press MENU.

The menu disappears.

To erase the tape title

Press CLEAR after step 4 above. The tape title is erased and the initial and latest dates of use for this tape reappear. If you want to erase these dates from the tape title column, press CLEAR again.

Protecting a recorded program



You can protect a recorded program using the SmartFile function from accidental over-recording or erasure. When you start recording from a position prior to the protected program, the recording stops automatically before the protected program.

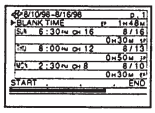
Before you start...

- Turn on your TV and set it to the video channel.

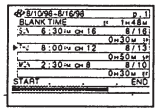
1 Insert a SmartFile tape.

The VCR turns on, the SMARTFILE indicator lights up, and the SmartFile search list automatically appears on the TV screen.

If the SmartFile tape is already inserted, press SMARTFILE.

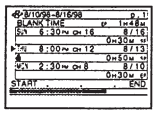


2 Push the cursor stick to ↑/↓ to select the program you want to protect.



3 Push the cursor stick to →.

The 🔒 indicator appears to the left of the selected program and the program becomes protected.



4 Press SMARTFILE.

The SmartFile search list disappears.

To unlock the protected program

Push the cursor stick to ← in step 4 above. The 🔒 indicator disappears and you can record over this program.

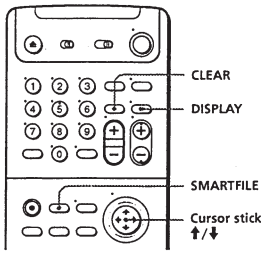
Tips

- When you start recording from a position prior to the protected program, the recording automatically stops no more than about three minutes in SP mode and about eight minutes in EP mode before the beginning of the protected program.
- If you protect a program just after the Blank Time space, BLANK TIME becomes shortened by about three minutes in SP mode and by about eight minutes in EP mode.
- If you try to record on a SmartFile tape containing a protected program, a message indicating that there is a protected program on this tape appears on the TV screen.

Notes

- When you record another program just after a protected program, locate the beginning of the Blank Time space by following the instructions in "Recording after locating the Blank Time space" on page 43. Otherwise, if the recording start point overlaps the protected program, the VCR may over-record the protected program.
- If the VCR Plus+, GUIDE Plus+, or manual timer setting overlaps the protected program, the VCR automatically stops recording before the protected program and ejects the tape.
- If you insert a SmartFile tape which contains a protected program or protect a program for the first time on a new tape, the VCR will analyze the position of the protected program for a few seconds. You cannot operate the VCR while the VCR is analyzing the tape.
- If the SmartFile list contains 12 protected programs, the next program you record won't be stored in the SmartFile list.

Erasing the data of an unwanted program



You can erase an unwanted program from the SmartFile list. When you erase a program from the list, that portion of tape is subject to Blank Time space priority.

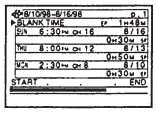
Before you start...

- Turn on your TV and set it to the video channel.

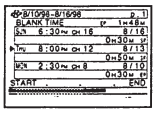
1 Insert a SmartFile tape.

The VCR turns on, the SMARTFILE indicator lights up, and the SmartFile search list automatically appears on the TV screen.

If the SmartFile tape is already inserted, press SMARTFILE.



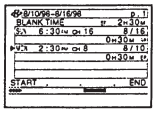
2 Push the cursor stick to ↑/↓ to select a program you want to erase from the list.



3 Press CLEAR.

The selected program is erased from the SmartFile list.

If you erase a program by mistake, press DISPLAY to make the program reappear.



4 Press SMARTFILE.

The SmartFile search list disappears.

Notes

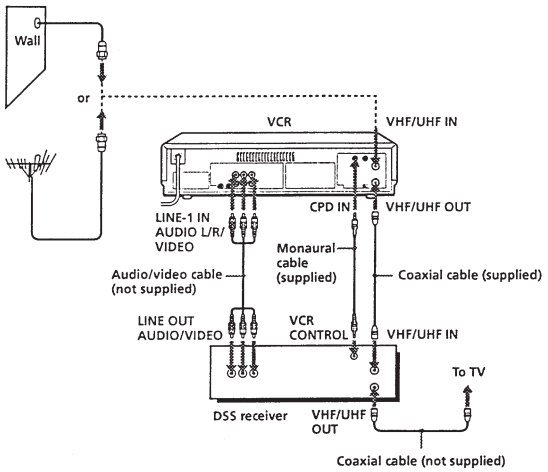
- You cannot erase a protected program from the SmartFile list. You have to first unlock the protected program by following the instructions in "To unlock the protected program" on page 53, then erase that program from the list.
- If a program is left about 15 minutes or less in EP mode, or about 5 minutes or less in SP mode, you cannot make the program reappear by using the DISPLAY button.

Storing program data from the DSS receiver (Program Data Download)

If you connect a DSS receiver equipped with the Program Data Download function and use the timer recording of the DSS receiver, the program and category name transmitted from the DSS are stored on the SmartFile tape. The DSS receiver equipped with the Data Download function will be available in the future.

How to hook up to the DSS receiver

You should connect CPD IN of the VCR and VCR CONTROL of the DSS receiver using the supplied monaural cable.



continued

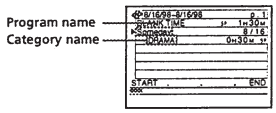
Storing program data from the DSS receiver (Program Data Download) (continued)

Setting up the DSS receiver

You have to set the VCR brand number on the DSS receiver. For example, select "99" in the VCR CONTROL menu to use a Sony VCR with the SmartFile function. For details, refer to the instruction manual of your DSS receiver.

Storing program data on the SmartFile tape

When you record a DSS program using the DSS receiver's timer, the program and category name are automatically stored on the SmartFile tape.



Notes

- Do not operate the VCR, the DSS receiver, and any other equipment connected to these units for at least two minutes after timer recording starts. If you operate these equipment immediately after timer recording starts, the correct program data may not be sent from the DSS receiver.
- When you use the VCR's timer for recording, program data from the DSS receiver is not stored on the SmartFile tape.

About the GUIDE Plus+ system

The GUIDE Plus+ system can display a two-day on-screen program list (transmitted from certain TV stations) on the TV screen. You can select the program you want to record from this program list.

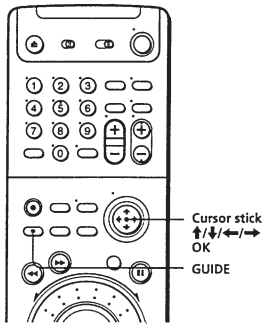
You need to use the on-screen menus to use the GUIDE Plus+ system. Learn how to select the GUIDE Plus+ on-screen menus before you use the GUIDE Plus+ system.

Learning the menu

Press GUIDE to enter the GUIDE Plus+ on-screen menu, then navigate with the cursor stick, blue and green colored buttons.

Before you start...

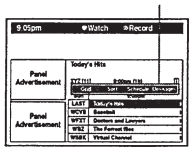
- Turn on your TV and set it to the video channel.



1 Press GUIDE.

The Grid menu appears on the TV screen with the Grid column highlighted on the menu bar. The cursor is the top item of the Grid menu.

If the program information signal in your area has several channel map patterns, the Channel map selection menu appears the first time you press the GUIDE button. In this case, you have to select the channel map on the Channel map selection menu. See "To select the channel map" on page 59.

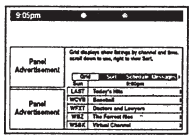


continued

About the GUIDE Plus+ system (continued)

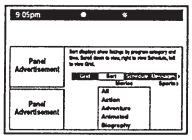
2 Push the cursor stick to ↑.

The cursor moves to the menu bar.



3 Push the cursor stick to ←/→ to select the menu you want to display.

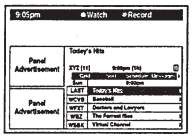
The selected menu appears on the TV screen.



To select an item

1 After selecting the menu, push the cursor stick to ↓.

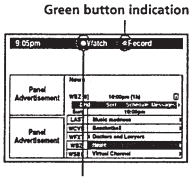
The cursor moves to the top item.



2 Push the cursor stick to ↑/↓/←/→ to select the item you want.

The cursor stick's ←/→ work only when there are items on the right and left.

If timer setting or other operations are available for the selected item, the names of the operations appear next to the blue or green button indications.



To close the menu

Press GUIDE.

To select the channel map

If the program information signal in your area has several channel map patterns, the Channel map selection menu appears on the TV screen. In this case, you have to select the channel map on the Channel map selection menu.

1 Push the cursor stick to ←/→ to select the channel map you want.

2 Press the cursor stick (OK).

The next program listing data transmission start time appears in the Grid menu.

3 Turn off the VCR.

Whenever the VCR is turned off, it is in data receiving standby mode, and will receive the program listing once per day.

If you set the wrong channel map, select the correct channel map following the steps below.

1 To clear the wrong channel map data, enter your ZIP/POSTAL CODE but change the last digit to another number which is different than the one for your area, then set it using the EASY SET UP.

2 Enter the correct ZIP POSTAL CODE for your area, then set it again using the EASY SET UP.

When the EASY SET UP finishes, wait until the VCR receives the GUIDE Plus+ program listing.

3 Press GUIDE, then select the correct channel map following the steps in "To select the channel map" again.

Notes

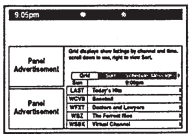
- If no programs appear on the program listing, the VCR hasn't received the GUIDE Plus+ data. To receive the GUIDE Plus+ program listing on a daily basis, be sure to turn off the VCR when not in use. Whenever the VCR is turned off, it is in data receiving standby mode, and will receive the program listing once per day. Select "No listing" on the Grid menu's program list to see the next data transmission start time. In most cases, it takes about two hours to download the data.
- The GUIDE Plus+ menu is displayed only in English; therefore, even if you select French or Spanish on the LANGUAGE menu, the GUIDE Plus+ menu appears only in English.
- You cannot display the GUIDE Plus+ menu when you press the GUIDE button if:
  - you display any other menu.
  - the VCR is in recording mode.
  - the VCR is in playback mode.

Overview of the GUIDE Plus+ menu

The GUIDE Plus+ system has six menus. See below for a summary of each menu. For details about the operations for each menu, see the pages listed next to each menu title.

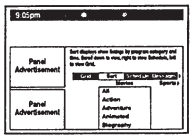
Grid menu (page 62)

You can view the program listings of up to 50 channels for the current time and on through midnight of the next day. After viewing the information about the programs, select the program you want to watch or record.



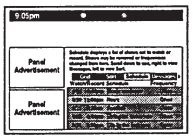
Sort menu (page 67)

You can search for a program by category, such as Movies or Sports. Programs for up to the next eight days appear in the menu. After viewing the information about the programs, select the program you want to watch or record.



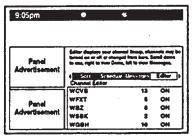
Schedule menu (page 70)

You can check and make changes to the recording or viewing schedule set on the Grid menu, Sort menu, or VCR Plus+. Use this menu to change the recording pattern (Once, Daily, Weekly) and tape speed. You can set VCR Plus+ recordings using the PlusCode on this menu.



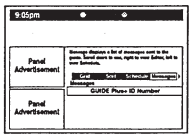
Editor menu (page 74)

You can select which channels to display on the Grid menu's program list.



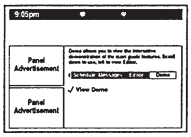
Messages menu

This menu is provided exclusively for service and repair personnel and is not intended for use during normal operation.

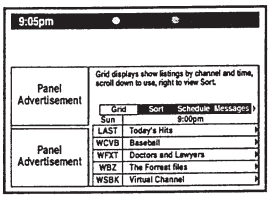


Demo menu (page 76)

You can practice operating the menu using the GUIDE Plus+ demonstration function.

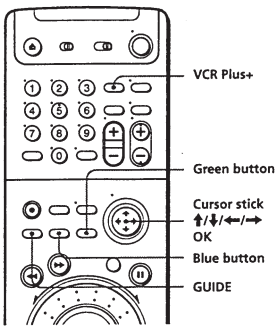


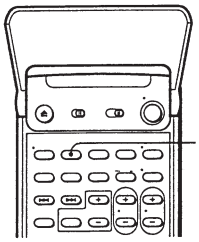
Using the Grid menu



You can view the program listing for the current time and on through midnight of the next day using the Grid menu. The program list contains up to 50 channels. You can set the GUIDE Plus+ timer for recording and/or viewing on the program list for up to 20 programs at one time.

To display the Grid menu, select Grid on the menu bar. See "Learning the menu" on page 57 for more information about the menu.





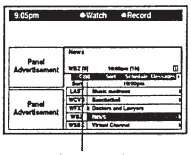
Getting information about a program

You can get information about a current or future program you want to watch or record. The program you were watching before using the GUIDE Plus+ menu is displayed in gray.

Select a program using the cursor stick (↑/↓/←/→). Basic information about the program appears in the information box.

Tip

- If [i] is displayed in the information box, you can receive detailed information about that program and view the program's channel listing by pressing the INFO button. You can set the GUIDE Plus+ timer to record by pressing the green (Record) button, or to view by pressing the blue (Watch) button.
  To go back to the Grid menu, press INFO.



Information box

Note

- If no programs appear on the program listing, the VCR hasn't received the GUIDE Plus+ data. To receive the GUIDE Plus+ program listing on a daily basis, be sure to turn off the VCR when not in use. Whenever the VCR is turned off, it is in data receiving standby mode, and will receive the program listing once per day. Select "No listing" on the Grid menu's program list to see the next data transmission start time. In most cases, it takes about two hours to download the data.

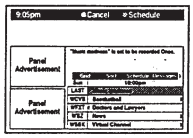
Watching a program

Push the cursor stick to ↑/↓/←/→ to select a currently broadcast program which you want to watch, then press the cursor stick (OK). The Grid menu disappears and you can watch the selected program.

continued

Setting the GUIDE Plus+ timer to record

Push the cursor stick to ↑/↓/←/→ to select the program you want to record, then press the green (Record) or VCR Plus+ button.



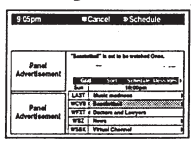
The selected program listing turns red, and the VCR is set to record this program in EP mode. Insert a tape with its safety tab in place and turn off the VCR before recording starts.

Tips

- You can cancel the GUIDE Plus+ timer settings, change the recording pattern (Once, Daily, or Weekly), and change the tape speed by using the Schedule menu (page 71). When you select a program for recording and press the green (Schedule) button, you will go to the Schedule menu.
- You can cancel the GUIDE Plus+ timer settings if you make a mistake by pressing the blue (Cancel) button. However, you cannot cancel timer settings on the Grid menu after you move the cursor to other programs.
- When you set the GUIDE Plus+ timer to record the program currently being broadcast, the VCR starts recording that program in the tape speed selected on the VCR.
- When you record a program on a SmartFile tape using the GUIDE Plus+ timer, the program and category name are automatically stored on the SmartFile list (page 41).

Setting the GUIDE Plus+ timer for viewing

Push the cursor stick to ↑/↓/←/→ to select the program you want to watch, then press the blue (Watch) button.



The selected program listing turns orange, and the VCR is placed in viewing timer standby mode. When the preset program begins, the VCR automatically turns on and sets the channel to the selected program's channel.

Tips

- You can cancel the GUIDE Plus+ timer settings and change the viewing pattern (Once, Daily, or Weekly) by using the Schedule menu (page 71). When you select a program for viewing and press the green (Schedule) button, you will go to the Schedule menu.
- You can cancel the GUIDE Plus+ timer settings if you make a mistake by pressing the blue (Cancel) button. However, you cannot cancel timer settings on the Grid menu after you move the cursor to other programs.
- Whenever the VCR is automatically turned on by the preset GUIDE Plus+ timer viewing function, the VCR automatically turns off after the preset program finishes. However, if you press any button while viewing the program, the VCR will not automatically turn off.

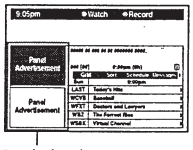
Viewing advertisements

GUIDE Plus+ has two different types of advertisements; a panel advertisement and a virtual channel advertisement. You can view detailed information about these advertisements and set the GUIDE Plus+ timer to record or view these programs.

To view a panel advertisement

All menus have a panel advertisement.

Push the cursor stick to ← repeatedly until the panel advertisement is selected. When the cursor is on the menu bar, push the cursor stick to ↓ to move the cursor to the top item, then push the cursor stick to ← repeatedly.



Panel advertisement

Detailed information about the panel advertisement appears. To go back to the original menu, push the cursor stick to →.

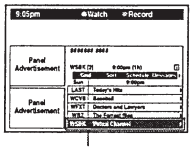
Tips

- You can set the GUIDE Plus+ timer to record that program by pressing the green (Record) button, or to view that program by pressing the blue (Watch) button.
- If there is no panel advertisement on the menu, you can view "Overview of the GUIDE Plus+ features" or "Getting Started Tips."

To view a virtual channel advertisement

The virtual channel advertisement is in the program list.

Push the cursor stick to ↑/↓ to select the virtual channel advertisement, then press INFO.



Virtual channel advertisement

Detailed information about the virtual channel advertisement appears. To go back to the original menu, press INFO.

Tip

- You can set the GUIDE Plus+ timer to record that program by pressing the green (Record) button, or to view that program by pressing the blue (Watch) button.

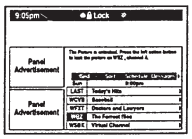
continued

Locking the channel behind the menu

As you select programs using the cursor stick (↑/↓/←/→), every time the cursor shifts, the program behind the menu changes as well. If you want to display the same channel behind the menu, you can set it so that one channel is locked-in behind the menu regardless of cursor movements.

1 Push the cursor stick to ← repeatedly until the channel column is selected.

2 Push the cursor stick to ↑/↓ to select the channel you want to lock-in.



3 Press the blue (Lock) button.

🔒 appears and the selected channel is locked-in.

To unlock, press the blue (Unlock) button in step 3.

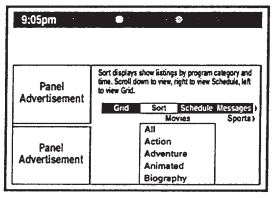
Closing the menu

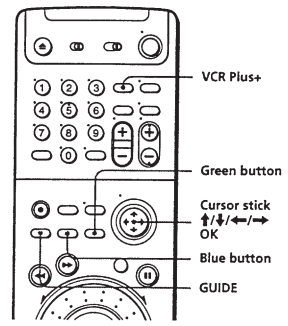
Press GUIDE.

Note

- If no programs appear on the program listing, the VCR hasn't received the GUIDE Plus+ data. To receive the GUIDE Plus+ program listing on a daily basis, be sure to turn off the VCR when not in use. Whenever the VCR is turned off, it is in data receiving standby mode, and will receive the program listing once per day. Select "No listing" on the Grid menu's program list to see the next data transmission start time. In most cases, it takes about two hours to download the data.

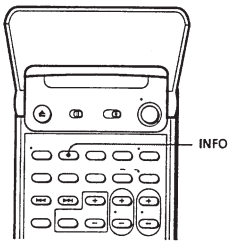
Using the Sort menu





You can display the program listings for the next eight days in the Sort menu according to category (movie, sports, etc.). Use this menu when you want to search for a program by category. You can set the GUIDE Plus+ timer for recording and/or viewing on the program list for up to 20 programs at one time.

To display the Sort menu, select Sort on the menu bar. See "Learning the menu" on page 57 for more information about the menu.



Viewing the program list by category

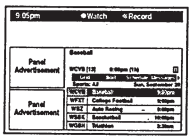
1 Push the cursor stick to ←/→ to select the category you want.

When the cursor is on the menu bar, push the cursor stick to ↓, then push the cursor stick to ←/→ to select the category.

continued

Using the Sort menu (continued)

2 Push the cursor stick to ↑/↓ to select the subcategory you want, then press the cursor stick (OK).



The program listing sorted by the selected category and subcategory appears.

3 Push the cursor stick to ↑/↓ to select the program you want.

Information about the program appears in the information box.

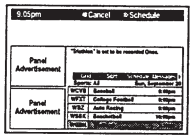
If [i] is displayed in the information box, you can receive detailed information about that program and view the program's channel listing by pressing the INFO button. You can set the GUIDE Plus+ timer to record by pressing the green (Record) button, or to view by pressing the blue (Watch) button.
To go back to the program list, press INFO.

To select another category, push the cursor stick to ↑ to select Sort on the menu bar, then press the cursor stick (OK). Repeat from step 1.

Tip
- After selecting a program on the Sort menu's program list, by pushing the cursor stick to ←/→, you can select the preceding or succeeding day's same time broadcast program.

Setting the GUIDE Plus+ timer to record

You can preset the timer to record a program on the program list.



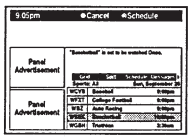
Push the cursor stick to ↑/↓/←/→ to select the program you want to record, then press the green (Record) or VCR Plus+ button.

The selected program listing turns red, and the VCR is set to record this program in EP mode. Insert a tape with its safety tab in place and turn off the VCR before recording starts.

Tips
- You can cancel the GUIDE Plus+ timer settings, change the recording pattern (Once, Daily, or Weekly), and change the tape speed by using the Schedule menu (page 71). When you select a program for recording and press the green (Schedule) button, you will go to the Schedule menu.
- You can cancel the GUIDE Plus+ timer settings if you make a mistake by pressing the blue (Cancel) button. However, you cannot cancel timer settings on the Sort menu after you move the cursor to other programs.
- When you set the GUIDE Plus+ timer to record the program currently being broadcast, the VCR starts recording that program in the tape speed selected on the VCR.
- When you record a program on a SmartFile tape using the GUIDE Plus+ timer, the program and category name are automatically stored on the SmartFile list (page 41).

Setting the GUIDE Plus+ timer for viewing

Display the program list, push the cursor stick to ↑/↓ to select the program you want to watch, then press the blue (Watch) button.



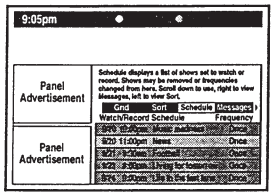
The selected program listing turns orange, and the VCR is placed in viewing timer standby mode. When the preset program begins, the VCR automatically turns on and sets the channel to the selected program's channel.

Tips
- You can cancel the GUIDE Plus+ timer settings and change the viewing pattern (Once, Daily, or Weekly) by using the Schedule menu (page 71). When you select a program for viewing and press the green (Schedule) button, you will go to the Schedule menu.
- You can cancel the GUIDE Plus+ timer settings if you make a mistake by pressing the blue (Cancel) button. However, you cannot cancel timer settings on the Sort menu after you move the cursor to other programs.
- Whenever the VCR is automatically turned on by the preset GUIDE Plus+ timer viewing function, the VCR automatically turns off after the preset program finishes. However, if you press any button while viewing the program, the VCR will not automatically turn off.

Closing the menu

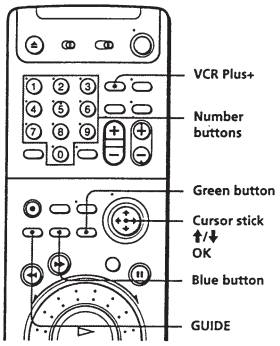
Press GUIDE.

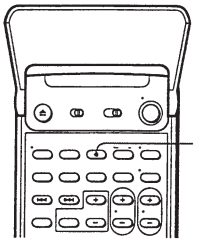
Using the Schedule menu



You can check the GUIDE Plus+ programs scheduled to record or be viewed in the Schedule menu. You can change the recording and/or viewing pattern (Once, Daily, or Weekly), change the recording speed, and cancel recordings and/or viewings. You can also use PlusCode to preset the VCR Plus+ recording schedule with this menu.

To display the Schedule menu, select Schedule on the menu bar. See "Learning the menu" on page 57 for more information about the menu.





Checking the VCR Plus+ and GUIDE Plus+ recording or viewing schedule

Push the cursor stick to ↑/↓ to find the preset programs.

Programs set to record are displayed in red, and programs set to be viewed are displayed in orange. Information about the selected program appears in the information box.

Changing the VCR Plus+ and GUIDE Plus+ recording or viewing pattern

To change the recording or viewing pattern, first push the cursor stick to ↑/↓ to select the program you want to change. Then press the green (Change) button repeatedly to select Once, Daily, or Weekly.
You cannot select Daily or Weekly for a program that airs more than seven days ahead.

Changing the recording speed

To change the recording speed, first push the cursor stick to ↑/↓ to select the program you want to change. Then press SP/EP to select the tape speed. The selected tape speed appears in the information box.

Canceling a VCR Plus+ or GUIDE Plus+ recording or viewing schedule

Push the cursor stick to ↑/↓ to select the program you want to cancel and press the blue (Remove) button. The selected program is canceled and disappears from the program list on the Schedule menu. If you cancel the program currently recording, the VCR automatically turns off.

Tip
- To stop the current VCR Plus+ or GUIDE Plus+ recording or viewing, select the program you want to stop and press the blue (STOP) button.

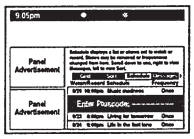
continued

Recording TV programs using VCR Plus+

You can set a future program which isn't on the GUIDE Plus+ list yet by using the PlusCode feature of VCR Plus+. For details about VCR Plus+, see "How VCR Plus+ works" on page 12.

1 Press VCR Plus+.

The Enter Pluscode screen appears.



2 Press the number buttons to enter the program's PlusCode.

If you make a mistake, press VCR Plus+ twice and re-enter the correct number.

3 Press the cursor stick (OK).

The selected program is added to the list, and VCR is set to record this program in EP mode. Insert a tape with its safety tab in place and turn off the VCR before recording starts.

Tip

- You can cancel the VCR Plus+ timer settings, change the recording pattern (Once, Daily, or Weekly), and change the tape speed by using the Schedule menu (page 71).

Note

- You cannot operate the Schedule menu while the Enter Pluscode screen is displayed on the TV screen. To close the Enter Pluscode screen, press VCR Plus+ button.

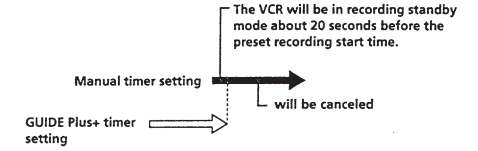
Closing the menu

Press GUIDE.

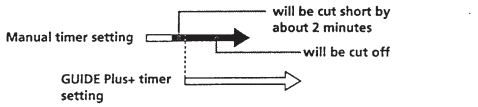
When the manual timer setting and the GUIDE Plus+ timer setting overlap

When the manual timer setting and the GUIDE Plus+ timer setting (including VCR Plus+ recording) overlap, the GUIDE Plus+ timer setting has priority. If you want to make more than one timer setting at one time, we recommend that you use the same timer setting method at that time for all timer settings, either the GUIDE Plus+ timer or the manual timer setting.

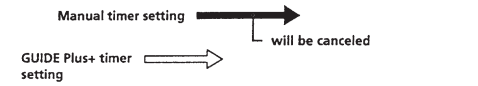
- If the recording stop time of the GUIDE Plus+ timer setting and the recording start time of the manual timer setting are set at the same time, the manual timer setting is canceled.


The VCR will be in recording standby mode about 20 seconds before the preset recording start time.
Manual timer setting
will be canceled
GUIDE Plus+ timer setting

- If the manual timer setting and GUIDE Plus+ timer setting are scheduled to start at the same time, the VCR starts recording the program preset with the GUIDE Plus+ timer.
- If the GUIDE Plus+ timer setting is scheduled to start while the VCR is already recording a manual timer setting, the VCR stops recording the manual timer setting and starts recording the GUIDE Plus+ timer setting. If the recording stop time of the manual timer setting and the recording start time of the GUIDE Plus+ timer setting are set at the same time, the VCR stops recording of the manual timer setting about two minutes before the preset stop time.



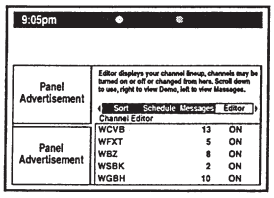
- If a manual timer setting is scheduled to start while the VCR is recording the GUIDE Plus+ timer setting, the manual timer setting is canceled.

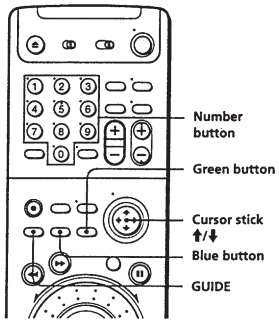


Note

- You cannot change the date, recording start and stop time, or channel of the GUIDE Plus+ timer setting after the recording schedule has been set. To make a correction, you need to cancel the GUIDE Plus+ timer setting and reset it from the beginning.

Using the Editor menu


9:05pm
Panel Advertisement
Editor displays your channel lineup, channels may be turned on or off or changed from here. Scroll down to use, right to view Demo, left to view Messages.
Sort Schedule Messages Editor
Channel Editor
Panel Advertisement
WCVB 13 ON
WFXT 5 ON
WBZ 8 ON
WSBK 2 ON
WGBH 10 ON



You can select the channels to be displayed on the Grid menu's program list using the Editor menu. You can display up to 50 channels on the program list. The channels are displayed in the order of the Editor menu channels. You cannot change the channel order. Customize your program list by selecting ON or OFF for each channel in the Editor menu.

To display the Editor menu, select Editor on the menu bar. See "Learning the menu" on page 57 for more information about the menu.

Selecting the channels to be displayed on the program list

Push the cursor stick to ↑/↓ to select the channel you want to hide or show. To display the channel on the program list, press the green (On/Off) button to select ON. To hide the channel, press the green (On/Off) button to select OFF.

Canceling a selected display setting

Push the cursor stick to ↑/↓ to select the channel you want to cancel. Then, press the blue (Cancel) button. The display setting (ON or OFF) is reset to its previous state. Once you close the Editor menu, you cannot cancel the display setting using this method. Use the above method "Selecting the channels to be displayed on the program list" instead.

Changing channel numbers

Push the cursor stick to ↑/↓ to select the channel you want to change. Using the number buttons, enter the new channel number which you want to assign to that station. The TV stations in your area appear in the channel list. Note, however, that depending on your connection type, you may not be able to receive certain broadcast stations.

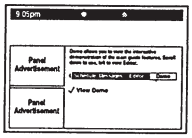
Note

- When changing channel numbers, be careful not to set the same channel number to two or more different broadcast stations.

Closing the menu

Press GUIDE.

Using the Demo menu



You can see a demonstration of the various menu operations of the GUIDE Plus+ system. Even if the VCR hasn't received the program list data of GUIDE Plus+, you can practice operating the GUIDE Plus+ system using this menu.

To display the Demo menu, select Demo on the menu bar. See "Learning the menu" on page 57 for more information about the menu.

Push the cursor stick to ↓ to select "✓ View Demo," then press the cursor stick (OK). The demonstration starts. If the VCR has received GUIDE Plus+ program list data, the demonstration will use the actual program list.

To stop a demonstration

Press GUIDE. The demonstration stops and the menu disappears.

Note

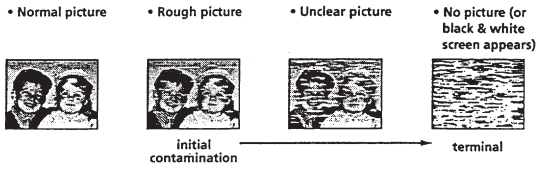
- If you use the cursor stick (↑/↓/←/→) during a demonstration, a different menu appears on the TV screen. However, the demonstration doesn't finish unless you press the GUIDE button and close the menu.

Troubleshooting

If you have any questions or problems not covered below, please consult your nearest Sony dealer.

	Symptom	Remedy
Power	The POWER switch does not function.	• Connect the AC power cord securely. • Make sure the VCR is not locked. To unlock, hold POWER down on the VCR until ⊶ indicator disappears.
	The power is turned on but the VCR does not operate.	• Moisture condensation occurs. Turn the power off, unplug the AC power cord and leave the VCR to dry for over an hour.
Clock	The clock has stopped and "–:– –" lights in the display window.	• The clock stops if the VCR is disconnected from the wall outlet for more than one hour. Reset the clock (and timer).
Playback	The playback picture does not appear on the TV screen.	• Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input.
	The picture is not clear.	• Adjust the tracking with the TRACKING +/– buttons. • The video heads are dirty (see below). Clean the video heads using the Sony T-25CLD, T-25CLDR, or T-25CLW video head cleaning cassette. If these cleaning cassettes are not available in your area, have the heads cleaned at your nearest Sony dealer (a standard service charge will be required). Do not use a commercially available liquid type cleaning cassette other than Sony's, as they may damage the video heads. • The video heads may have to be replaced. Consult your local Sony dealer for more information.
	The picture rolls vertically during picture search.	• Adjust the vertical hold control on the TV or monitor.
	The picture has no sound.	• The tape is defective. • If you made A/V connections, check the audio cable connection.

Symptoms caused by contaminated video heads



continued

Troubleshooting (continued)

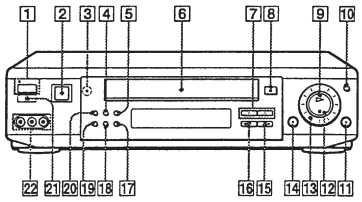
	Symptom	Remedy
Recording	A TV program does not appear on the TV screen.	• Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input.
	TV reception is poor.	• Adjust the TV antenna.
	The tape starts playing as soon as it is inserted.	• The safety tab has been removed. To record on this tape, cover the tab hole.
	The tape is ejected when you press ● REC.	• Check that the safety tab has not been removed.
	Nothing happens when you press ● REC.	• Make sure the tape is not at its end. • Select the correct source with the INPUT SELECT button. Select a channel number when recording TV programs; select "L1" or "L2" when recording from other equipment. • The current position of the tape is record protected. Search for the recording available space.
	Recording stops halfway.	• If the tape contains a protected program, recording automatically stops before the protected program. Use another tape which has enough recording space.
Timer recording	The timer does not operate.	• Check that the clock is set. • Make sure a tape has been inserted. • Check that the safety tab has not been removed. • Make sure the tape is not at its end. • The recording start point overlaps the protected program. • Make sure a program has been set for timer recording. • Make sure your timer settings have not already passed the current time. • Check that the cable box is turned on. • The clock stops if the VCR is disconnected from the wall outlet for more than one hour. Reset the clock and timer. • When you use cable box control, make sure the CABLE BOX CONTROL option is set to ON.

	Symptom	Remedy
GUIDE Plus+	The Grid menu doesn't appear on the TV screen when you press GUIDE.	• If using a cable box, check that it is turned on. • Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input. • Check that the VCR is in stop mode.
	The program listing data disappeared from the program list.	• A power cut occurred or the VCR was disconnected from the wall outlet for more than one hour. Turn off the VCR so that the VCR can receive the program listing data.
	The VCR has not received the program listing data.	• Turn off the VCR. The next data transmission start time appears in the information box of the Grid menu.
	The GUIDE Plus+ or VCR Plus+ timer recording program does not record, or timer recording stops halfway.	• A power cut occurred during the timer recording.
Others	A tape cannot be inserted.	• Check that a tape isn't already in the tape compartment.
	The remote commander does not function.	• Make sure you are pointing the remote commander at the remote sensor on the VCR. • Replace all the batteries in the remote commander with new ones if they are weak. • If you are not using S-Link™, make sure that both miniplugs are unconnected. • The command mode of the remote commander is different from the one of the VCR.
	The channels on the VCR cannot be changed.	• Make sure the CABLE BOX CONTROL option is set to OFF.
	The tracking meter does not appear on the screen.	• The recording condition of the tape is very poor and tracking cannot be adjusted.
	You cannot control other TVs.	• Set your TV's code number. The code number resets when you replace the batteries of the remote commander.
	The VCR needs to be cleaned.	• Clean the cabinet, panel and controls with a dry, soft cloth, or a soft cloth slightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine.

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

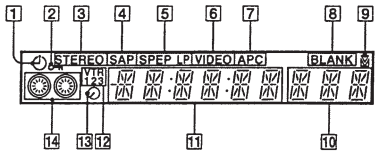
Front panel



1 POWER switch/indicator (13, 16)
2 SmartFile sensor (46)
3 SMARTFILE indicator (41, 46)
4 INPUT SELECT button (7, 37)
5 EASY SET UP button
6 Tape compartment
7 CHANNEL/TRACKING +/– buttons (7, 33)
8 ⏏ EJECT button (5)
9 ▷ PLAY button (4, 18)
10 JOG button/indicator (19)
11 ● REC (record) button (7, 37)
12 ■ STOP button (5, 37)
13 Shuttle ring (8, 19)
14 ❚❚ PAUSE button (5, 37)
15 ▶▶ FF (fast forward) button (5, 18, 23)
16 ◀◀ REW (rewind) button (5, 18, 23)
17 COMMAND MODE button
18 OK button (44)
19 CURSOR ↓ button (46)
20 SMARTFILE button (41, 45)
21 Remote sensor
22 LINE-2 IN VIDEO/AUDIO L/R jacks (36)

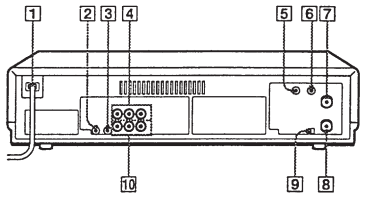
continued

Display window



1 Timer indicator (13)
2 Child Lock indicator (14)
3 STEREO indicator (30)
4 SAP (Second Audio Program) indicator (30)
5 Tape speed indicator (7)
6 VIDEO indicator (8)
7 APC (Adaptive Picture Control) indicator (33)
8 BLANK indicator (43)
9 Tracking indicator (33)
10 Line/channel indicator (7, 37)
11 Time counter/clock (5)
12 Command mode indicator
13 Remaining time indicator (8)
14 Tape/recording indicator (7)

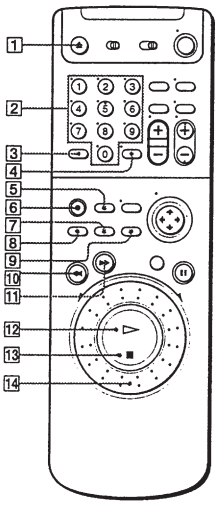
Rear panel



1 AC power cord
2 S LINK (CONTROL S IN) jack (36)
3 CABLE BOX CONTROL (CONTROL S OUT) jack
4 LINE-1 IN AUDIO L/R/VIDEO jacks (36, 55)
5 CPD (Control and Program Data) IN jack (55)
6 G-Link jack*
7 VHF/UHF IN connector (55)
8 VHF/UHF OUT connector (55)
9 RF (Radio Frequency) UNIT switch
10 LINE OUT AUDIO L/R/VIDEO jacks

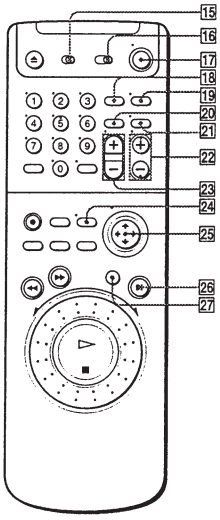
continued

Remote commander



1 ⏏ EJECT button (5)
2 Number buttons (13, 72)
3 SET button (24)
4 ENTER button (10, 25)
5 SMARTFILE button (41, 45)
6 ● REC (record) button (7)
7 Blue button (63, 64, 66, 71)
8 GUIDE button (57)
9 Green button (13, 63, 64, 71, 74)
10 ◀◀ REW (rewind) button (5, 18, 23)
11 ▶▶ FF (fast forward) button (5, 18, 23)
12 ▷ PLAY button (4)
13 ■ STOP button (5)
14 Shuttle ring (8, 19)

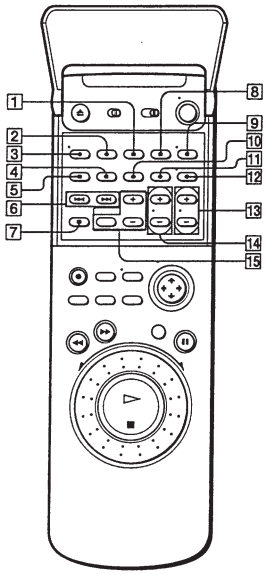
* This jack is provided for future expected functions.



15 TV/VIDEO switch
16 COMMAND MODE switch
17 POWER switch (13, 16)
18 VCR Plus+ button (13, 64, 72)
19 TV/VIDEO button (8)
20 CLEAR button (27, 48)
21 DISPLAY button (5, 21, 54)
22 CH (channel) +/– buttons (7)
23 VOL (volume) +/– buttons
24 MENU button (15)
25 Cursor stick (13, 16, 43, 58)
↑/↓/←/→
OK
26 II PAUSE button (5)
27 JOG button/indicator (19)

continued

Remote commander, with top cover opened

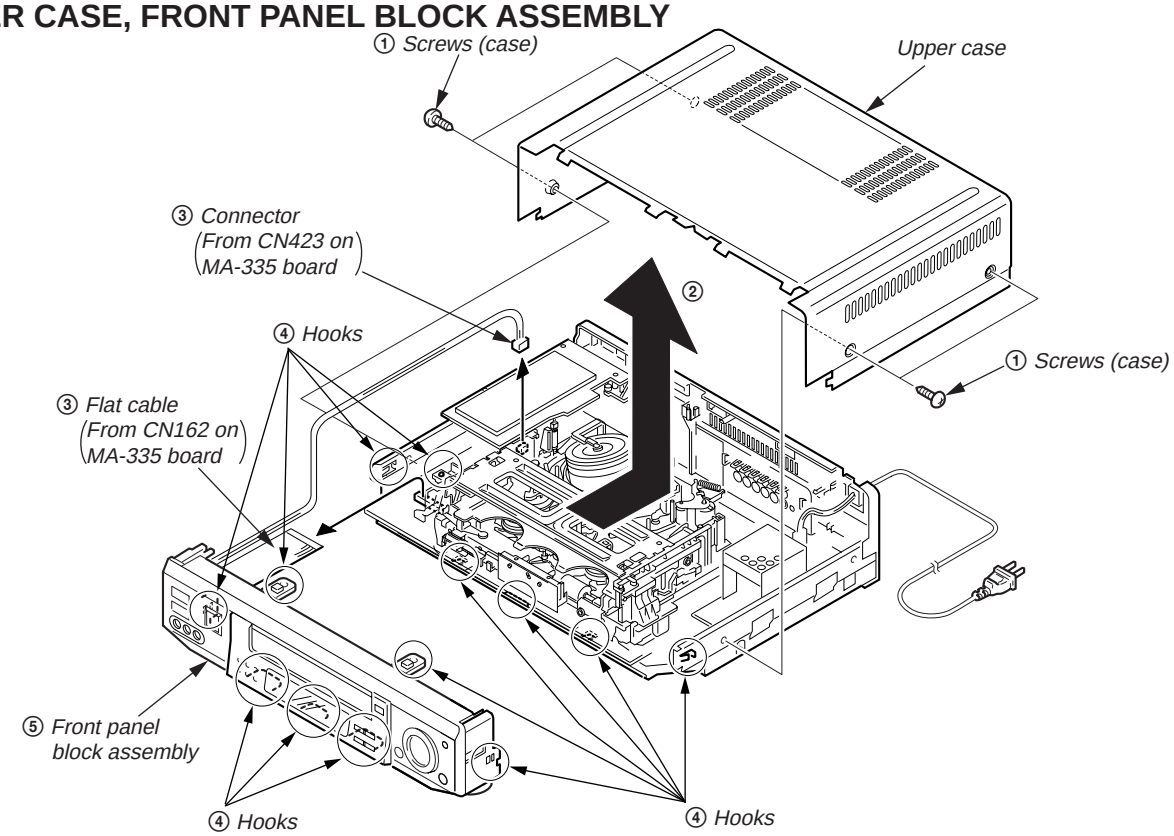


1 SP (Standard Play)/EP (Extra Play) button (7)
2 INFO (information) button (63)
3 AUDIO MONITOR button (30)
4 COUNTER RESET button (5)
5 QUICK TIMER button (26)
6 ⏮/⏭ INDEX SEARCH buttons (32)
7 SMART CUE button (5)
8 INPUT SELECT button (7, 37)
9 TV/VIDEO button (8)
10 COUNTER/REMAIN button (8)
11 CLEAR button (27, 48)
12 DISPLAY button (5, 21, 54)
13 CH (channel) +/– buttons (7)
14 VOL (volume) +/– buttons
15 Receiver operation buttons
RECEIVER VOL (volume) +/– buttons
MUTING button

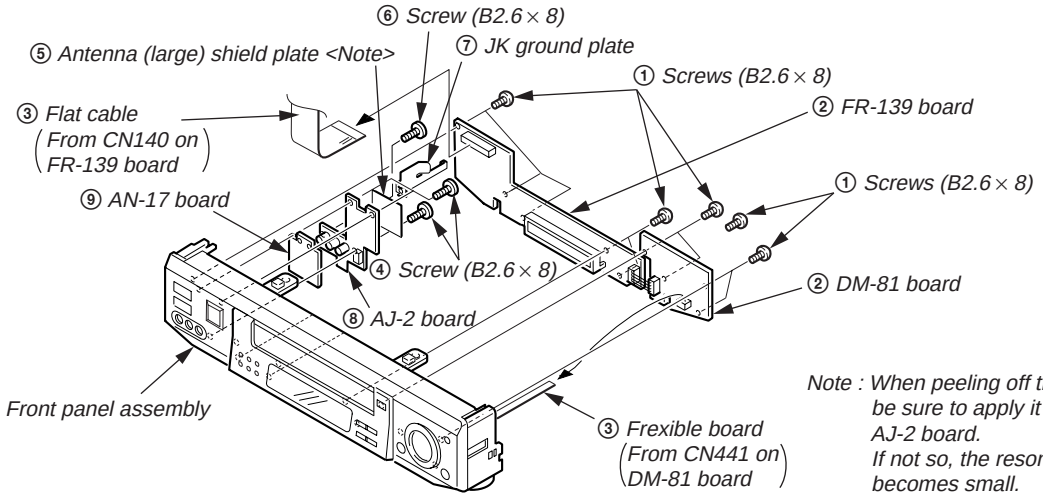
SECTION 2
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

2-1. UPPER CASE, FRONT PANEL BLOCK ASSEMBLY

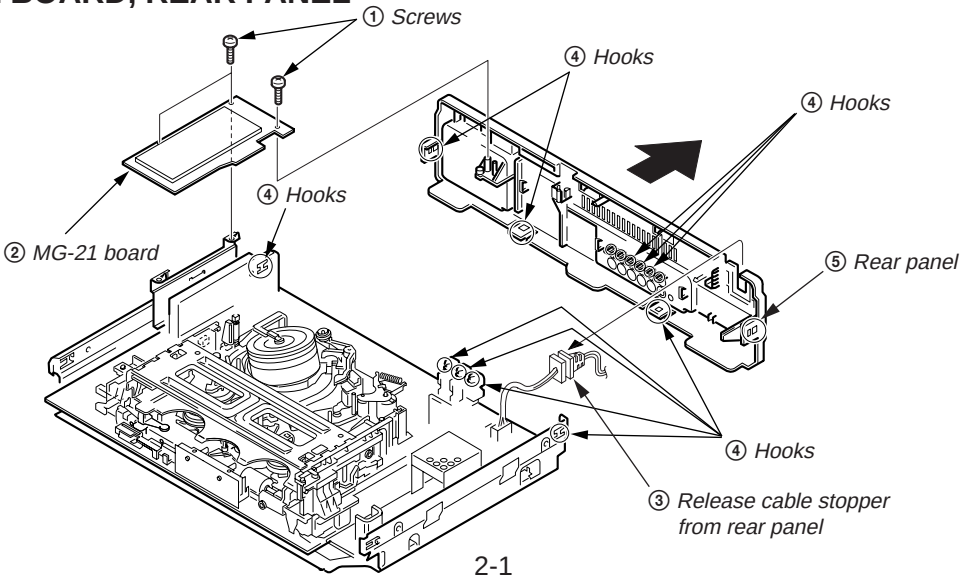


2-2. FR-139, DM-81, AJ-2, AN-17 BOARDS



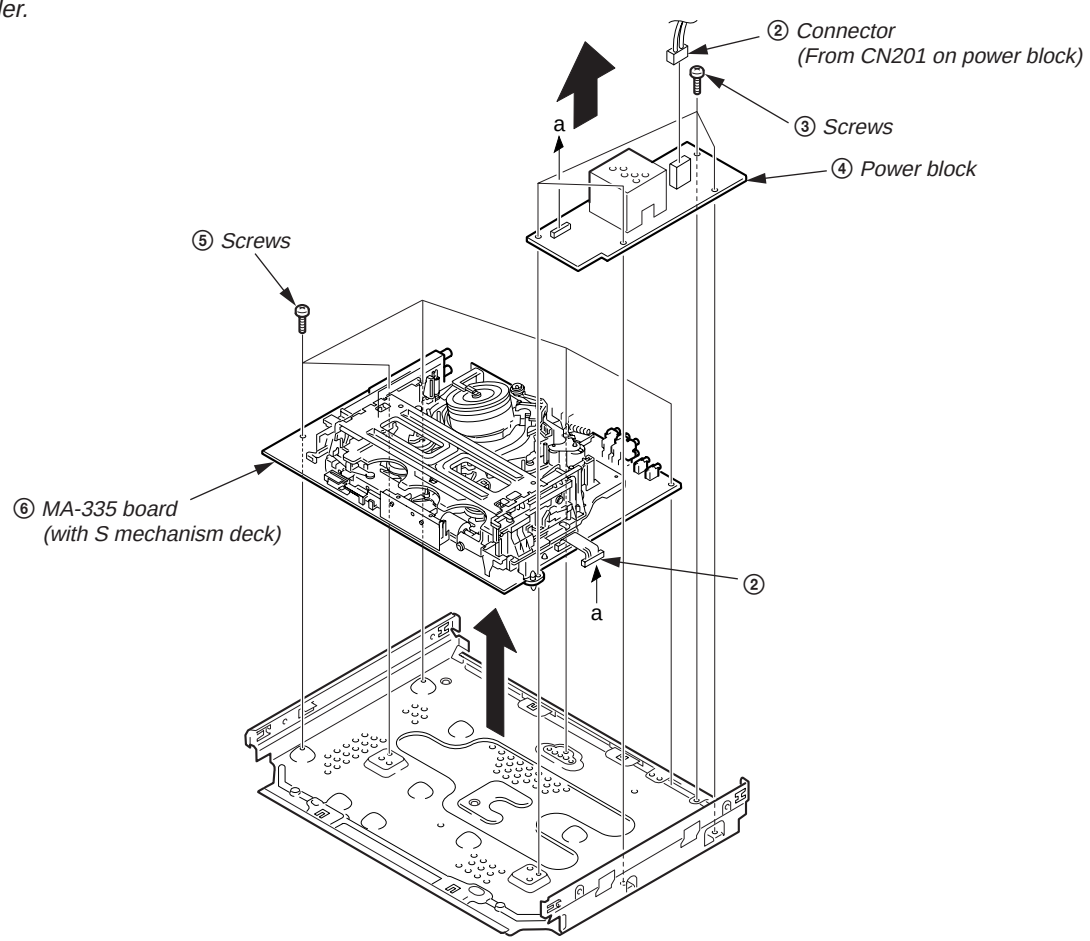
Note : When peeling off the antenna (large) shield plate, be sure to apply it to the original position on the AJ-2 board.
If not so, the resonance level of AN-17 board becomes small.

2-3. MG-21 BOARD, REAR PANEL

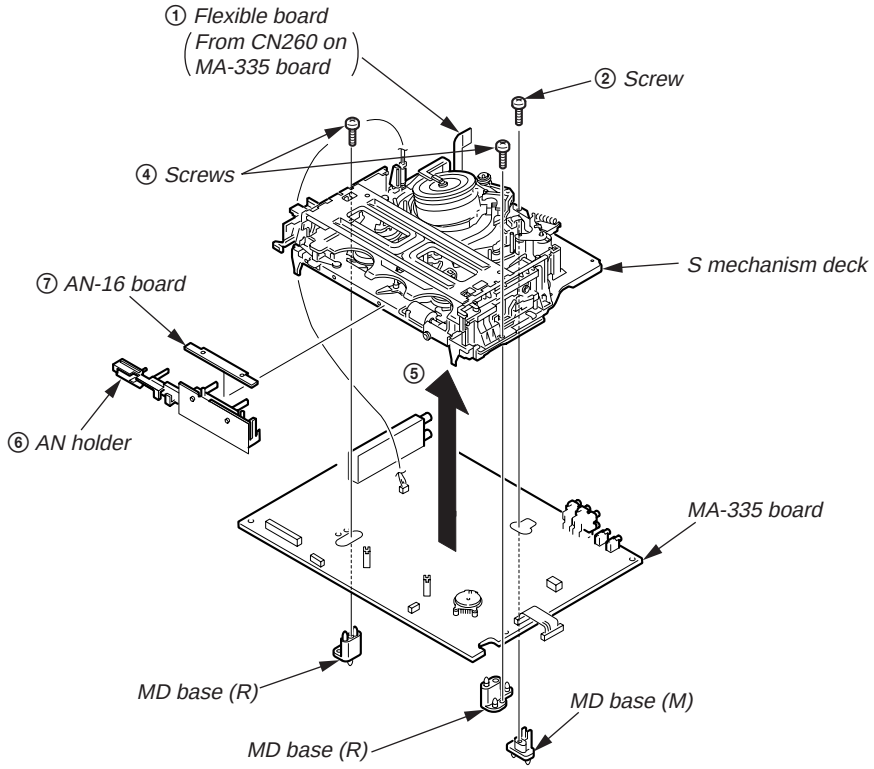


2-4. POWER BLOCK, MA-335 BOARD (WITH S MECHANISM DECK)

① *Remove two screws securing NL holder and remove NL holder.*

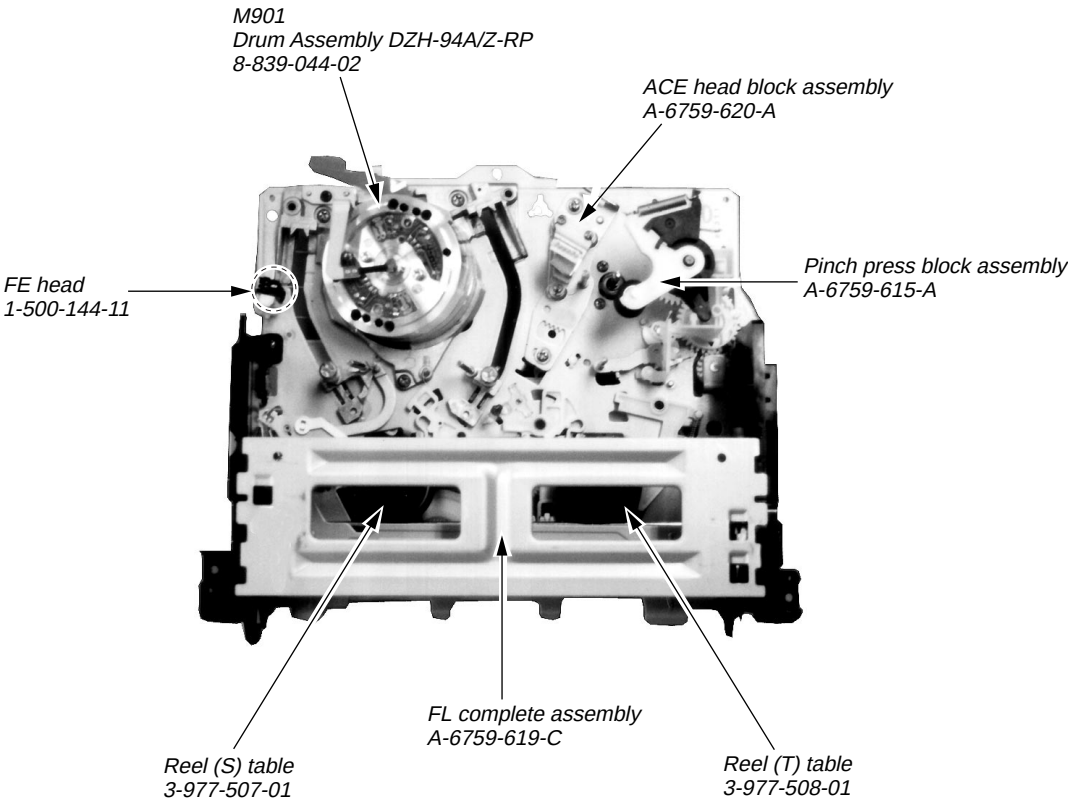


2-5. AN-16 BOARD, S MECHANISM DECK

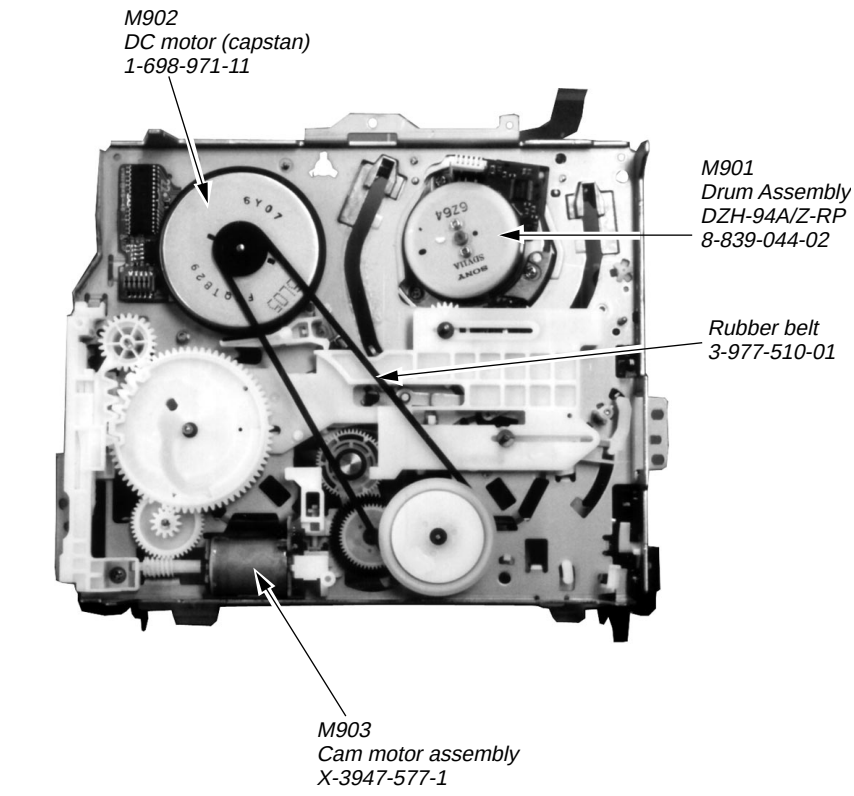


2-6. INTERNAL VIEWS

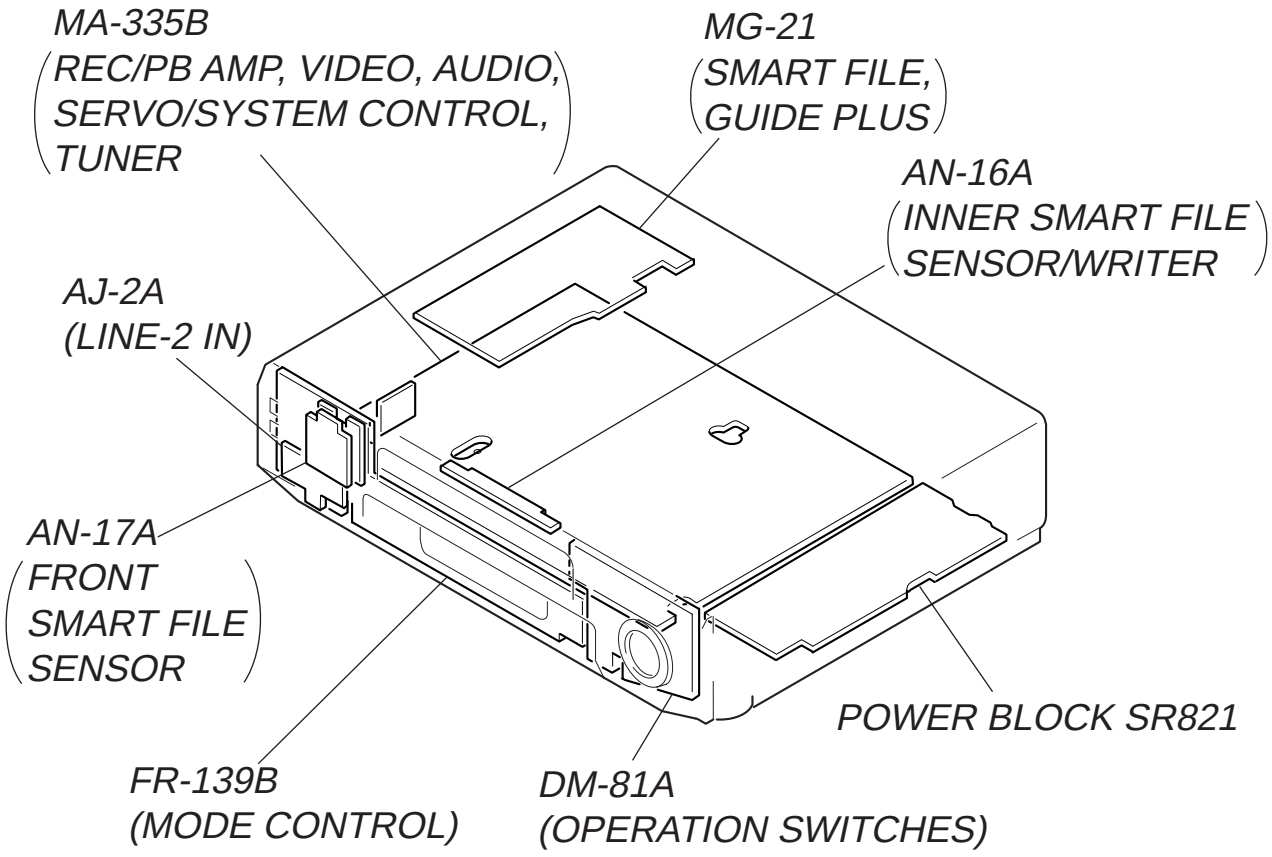
— Top View —



— Bottom View —

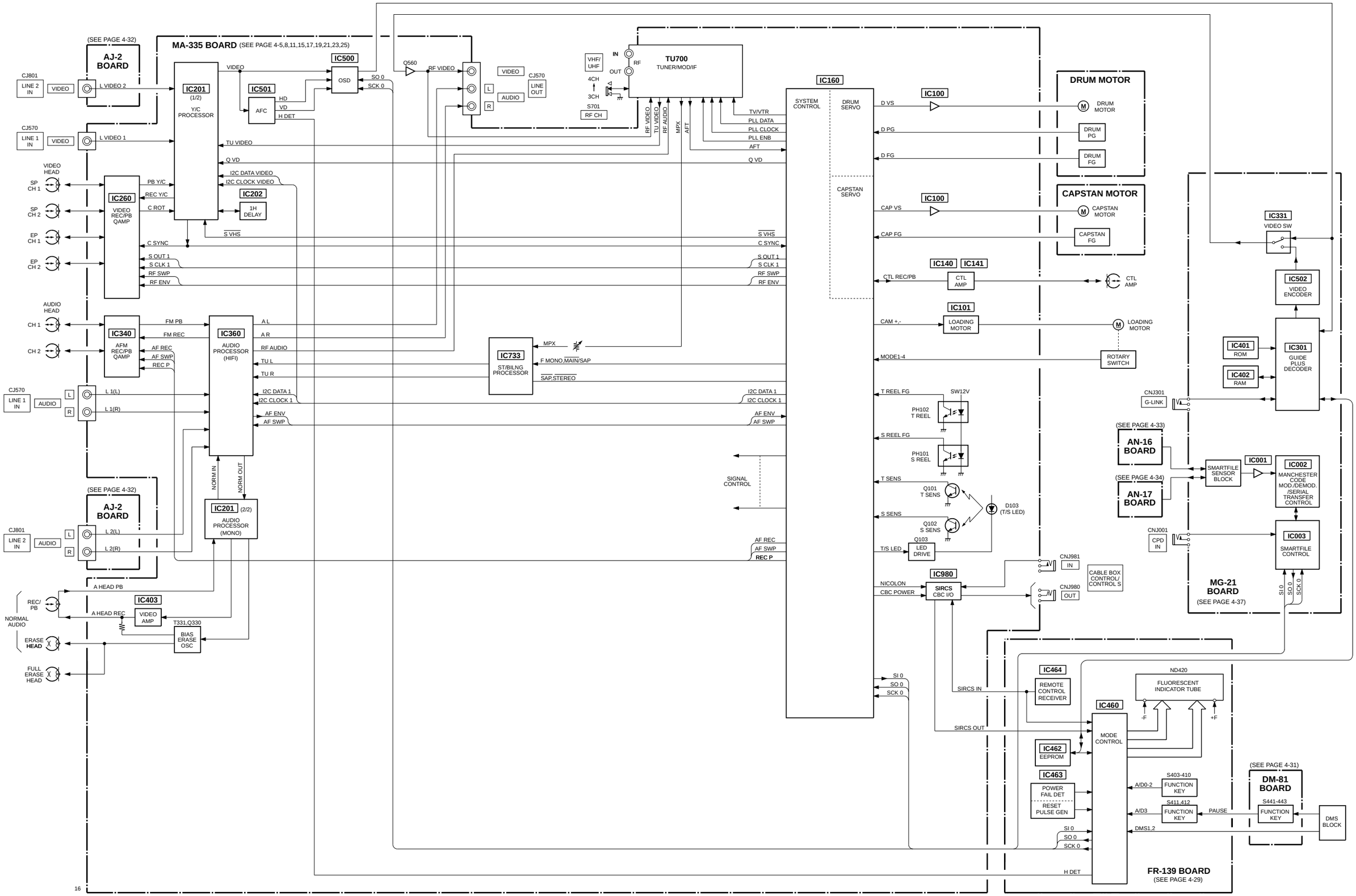


2-7. CIRCUIT BOARDS LOCATION

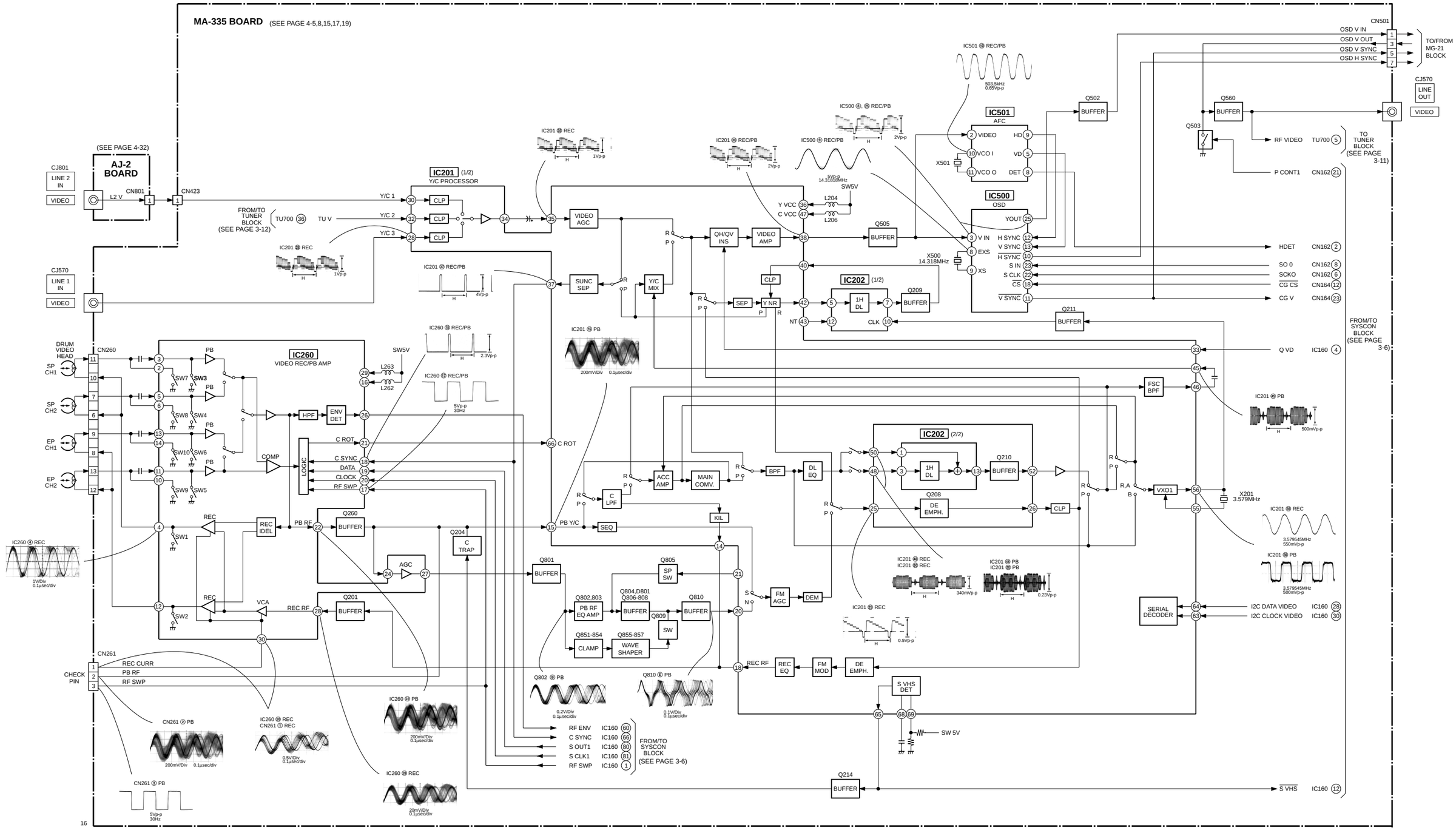


SECTION 3
BLOCK DIAGRAMS

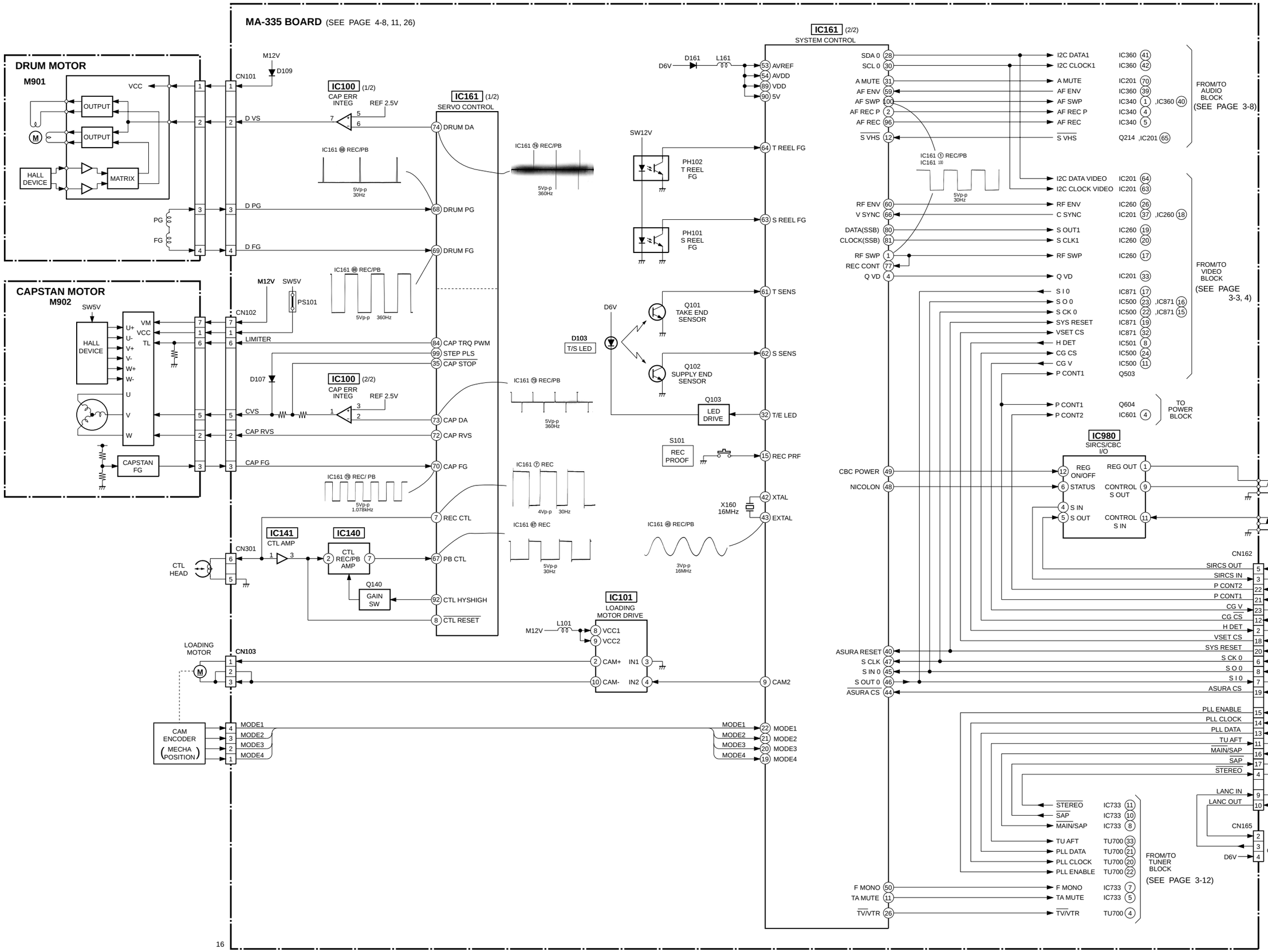
3-1. OVERALL BLOCK DIAGRAM



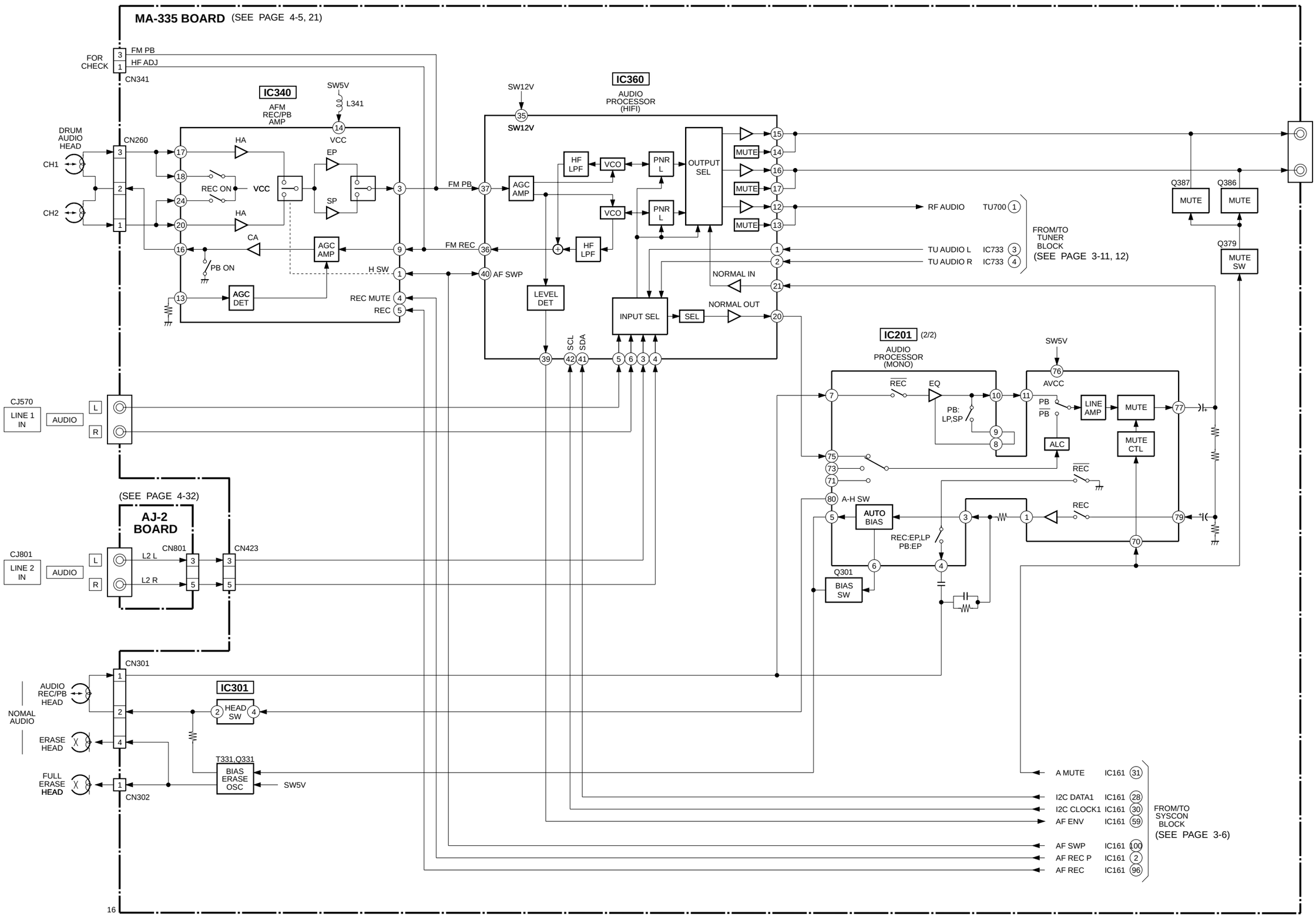
3-2. VIDEO BLOCK DIAGRAM



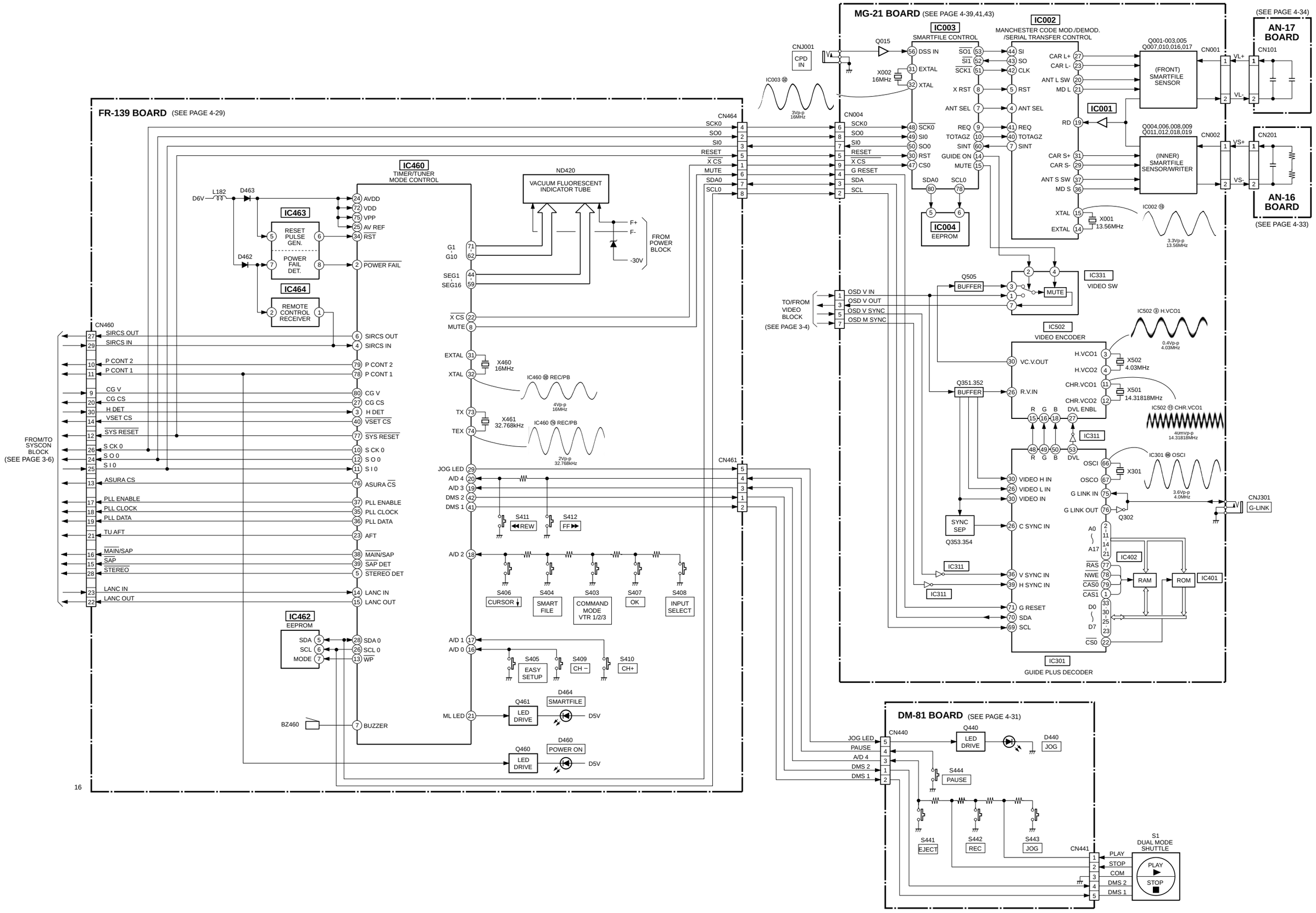
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



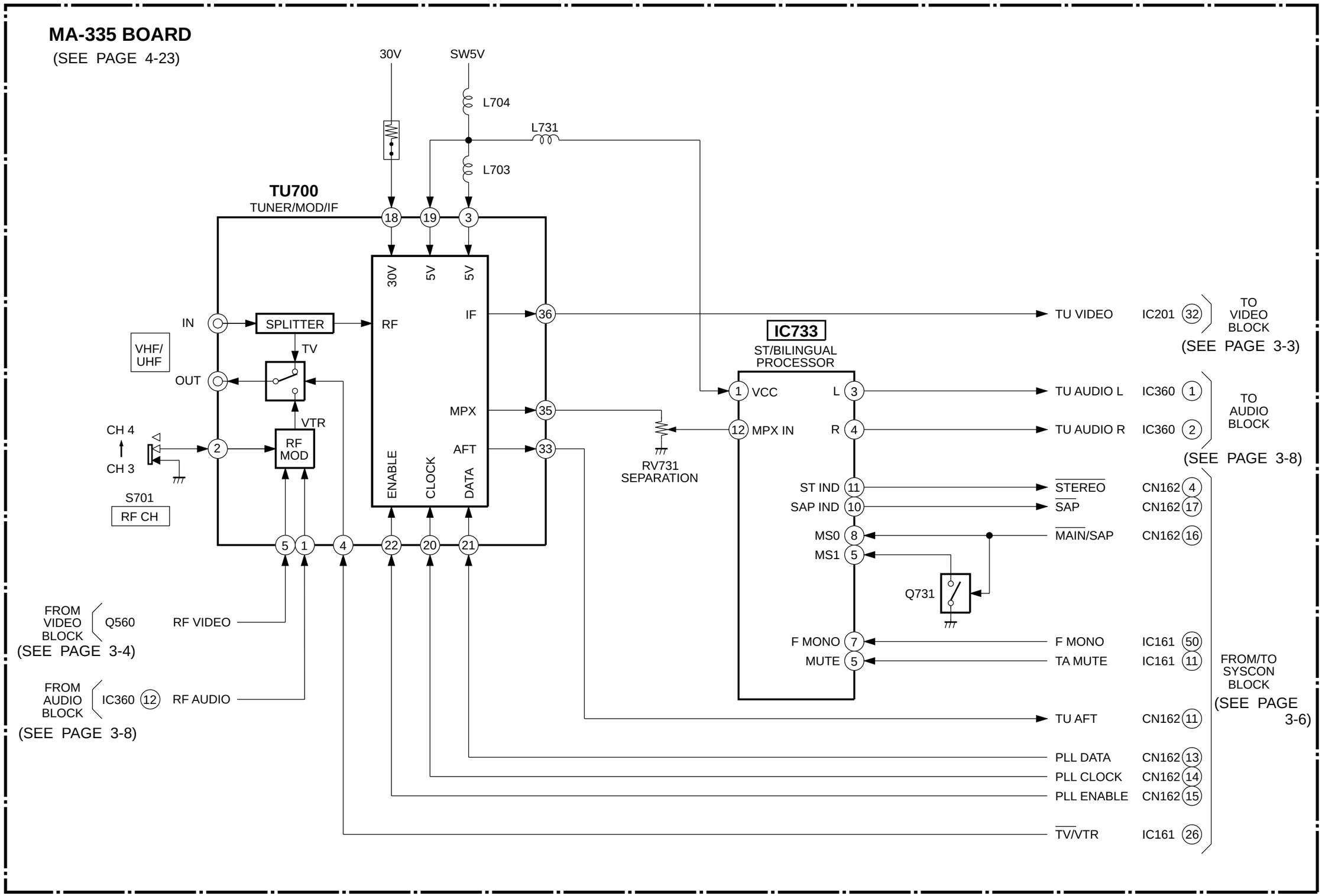
3-4. AUDIO BLOCK DIAGRAM



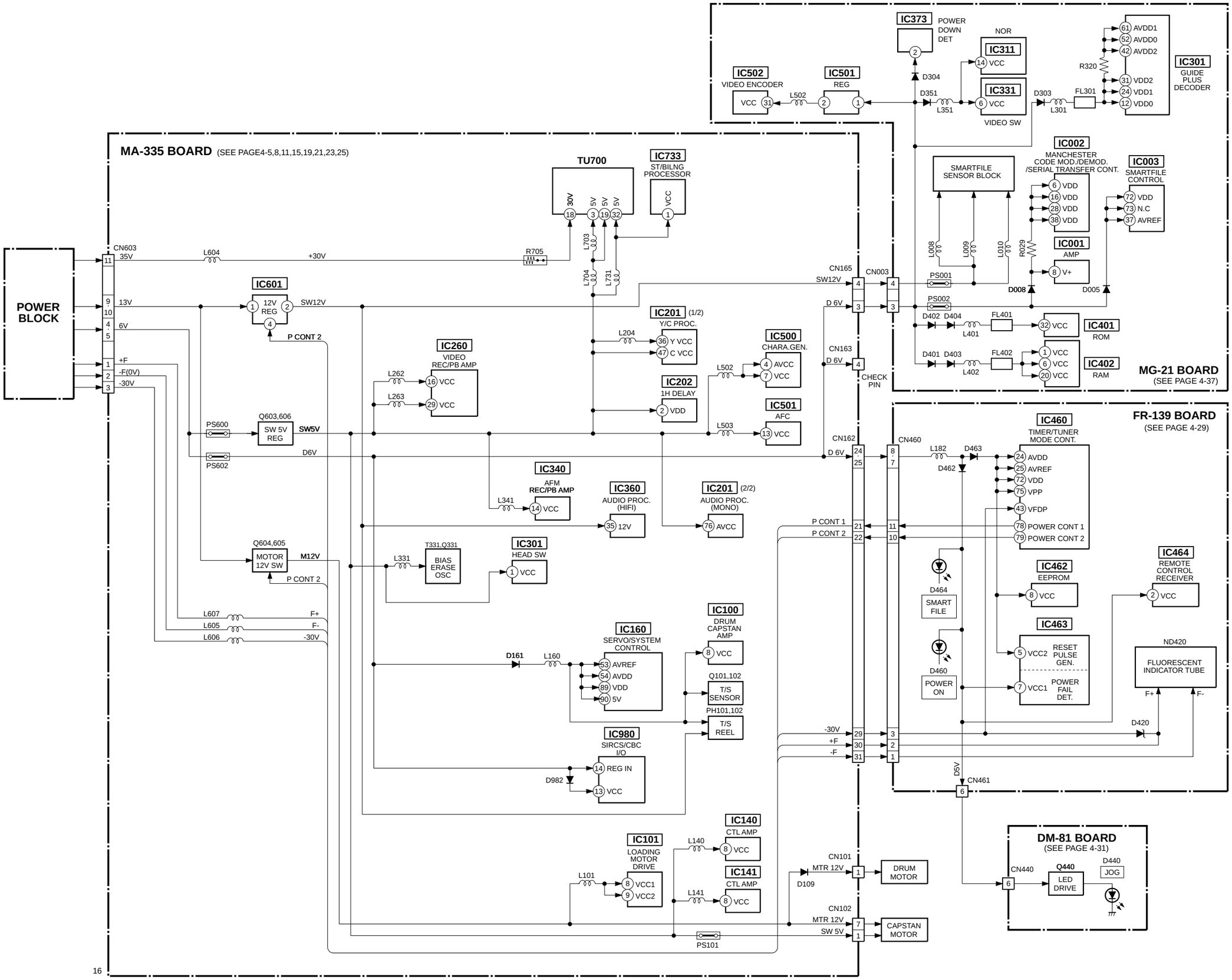
3-5. MODE CONTROL BLOCK DIAGRAM



3-6. TUNER BLOCK DIAGRAM

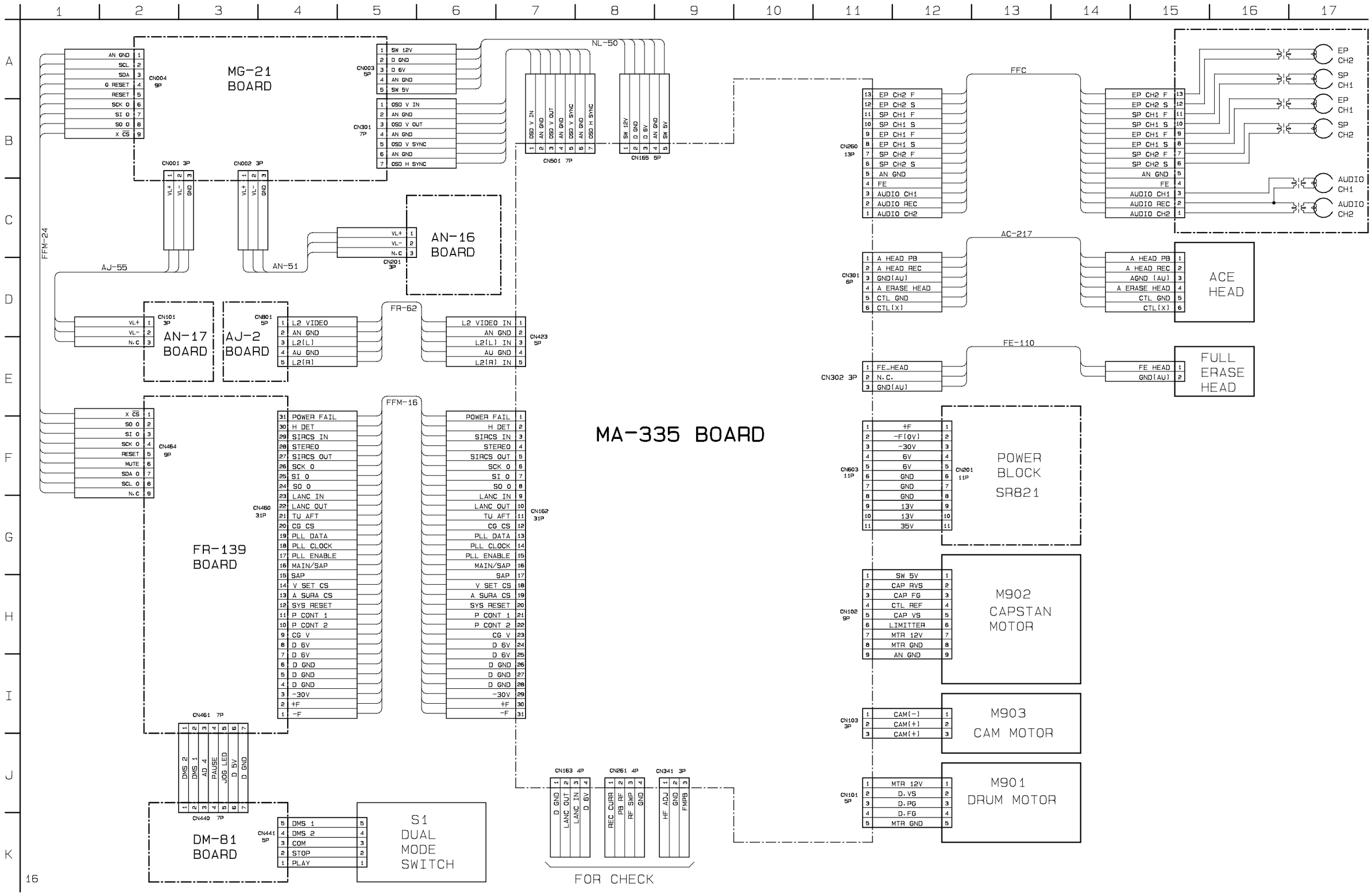


3-7. POWER SUPPLY BLOCK DIAGRAM



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



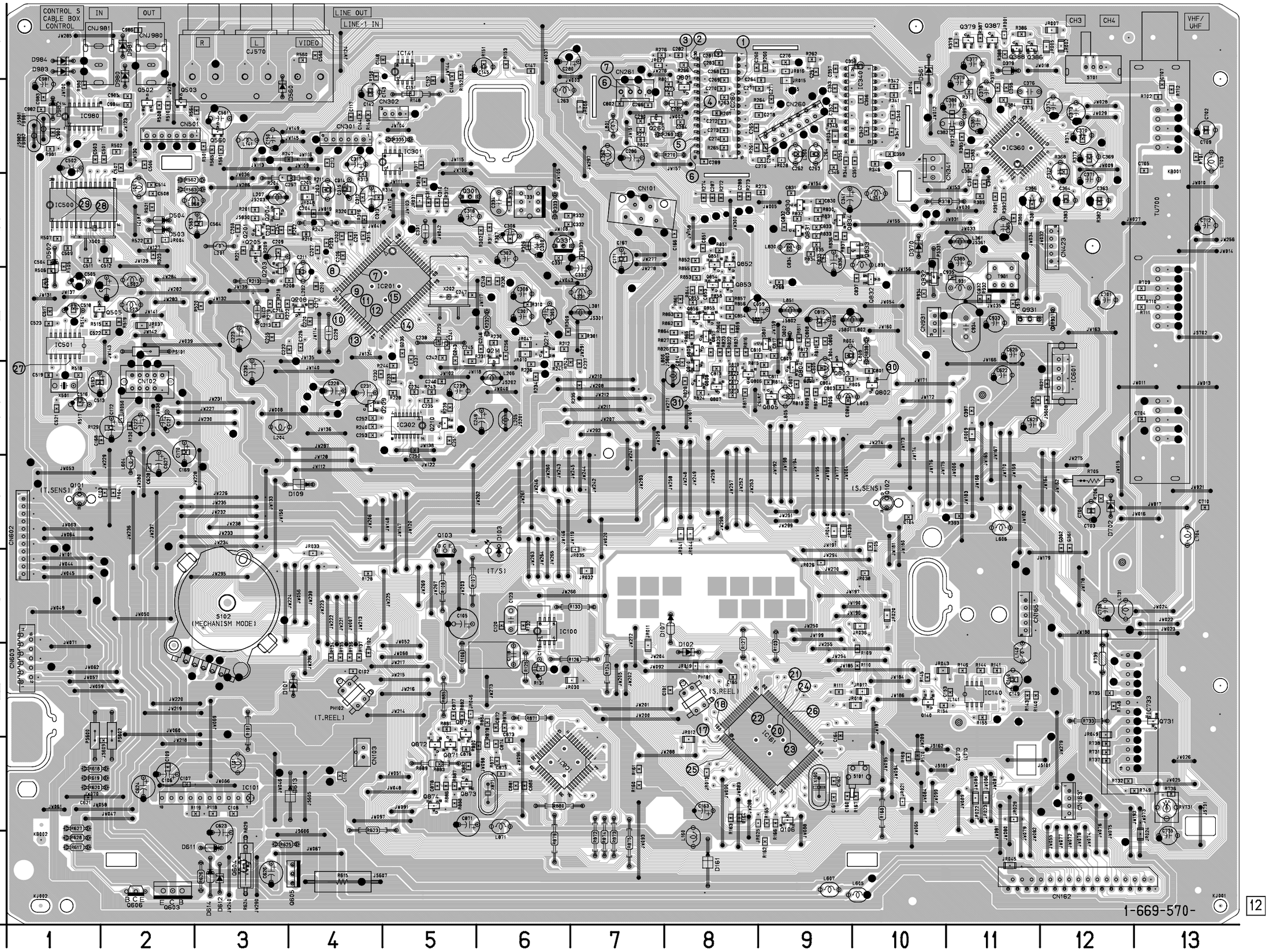
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

MA-335 (REC/PB AMP, VIDEO, SERVO/SYSTEM CONTROL, AUDIO, TUNER) PRINTED WIRING BOARD

— Ref. No.: MA-335 Board; 1,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

MA-335 BOARD (CONDUCTOR SIDE)

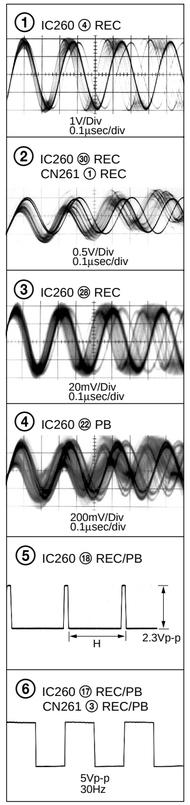


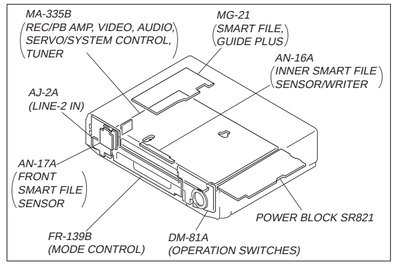
MA-335 (REC/PB AMP) SCHEMATIC DIAGRAM
— Ref. No.: MA-335 Board; 1,000 Series —

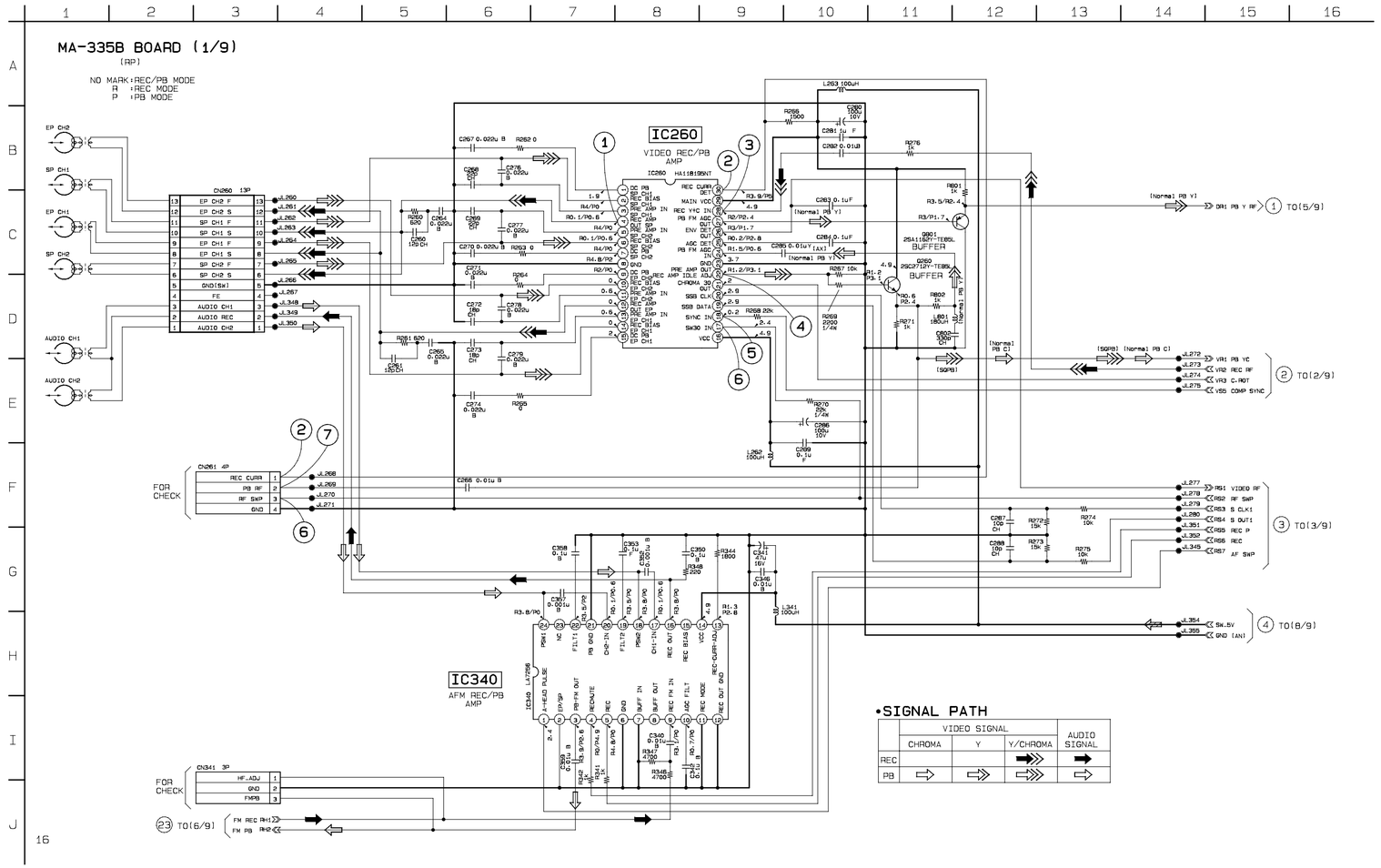
MA-335 BOARD

CJ570	A-3	D982	B-1	Q301	C-5
		D983	A-1	Q331	C-6
CN101	C-7	D984	A-1	Q379	A-11
CN102	E-2			Q386	A-11
CN103	I-4	IC100	G-6	Q387	A-11
CN162	J-12	IC101	I-3	Q502	B-2
CN163	I-12	IC140	H-11	Q503	B-2
CN165	G-11	IC141	A-5	Q505	D-1
CN260	B-9	IC161	I-9	Q560	B-3
CN261	B-7	IC201	D-5	Q603	J-2
CN301	B-4	IC202	E-5	Q604	J-3
CN302	B-5	IC260	B-8	Q605	J-4
CN341	B-10	IC301	B-5	Q606	J-2
CN423	C-12	IC340	B-10	Q731	H-13
CN603	H-1	IC360	B-11	Q801	B-8
		IC500	C-1	Q802	E-10
CNJ980	A-2	IC501	D-1	Q803	E-9
CNJ981	A-1	IC601	E-12	Q804	E-9
		IC733	H-13	Q805	E-9
D103	F-6	IC871	I-6	Q806	E-8
D107	G-8	IC980	B-1	Q807	E-8
D109	F-4			Q808	E-8
D161	J-8	PH101	H-8	Q809	D-8
D370	C-10	PH102	H-4	Q810	E-8
D379	A-11			Q851	C-8
D502	C-1	Q101	F-1	Q852	C-8
D503	C-2	Q102	F-10	Q853	D-8
D504	C-2	Q103	F-5	Q854	D-8
D560	B-3	Q140	H-10	Q855	D-8
D561	A-10	Q201	C-3	Q856	D-8
D611	J-3	Q204	C-3	Q857	D-8
D612	J-3	Q205	C-3	Q871	I-5
D614	J-3	Q208	D-4	Q872	I-5
D702	F-12	Q209	E-4	Q873	I-5
D801	D-9	Q210	E-5	Q874	I-5
D802	D-9	Q211	D-6	Q875	H-5
D980	A-2	Q214	D-6		
D981	A-2	Q260	B-7		

MA-335 BOARD







•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			⇨	⇨
PB	⇨	⇨	⇨	⇨

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS. (In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ▒▒▒ : Pattern from the side which enables seeing.

Caution :

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Pattern face side: (Component Side)	parts on the parts face side seen from the parts face are indicated.

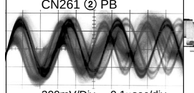
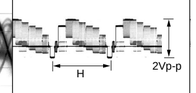
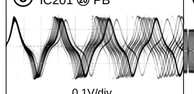
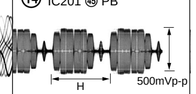
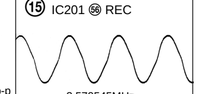
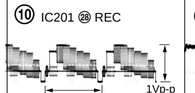
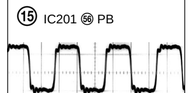
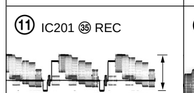
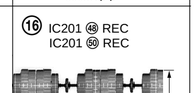
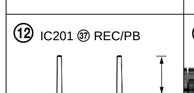
- **For schematic diagrams.**
- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistor are in ohms, 1/4W unless otherwise noted. Chip resistor are 1/10W unless otherwise noted. kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in µF unless otherwise noted. pF : µµF. 50V or less are not indicated except for electrolytics and tantalums.
- ▭ : panel designation.
- △ : internal component.
- ▬ : B+ Line.
- ▬ ▬ : B– Line.
- ⇨ : IN/OUT direction of (+,–) B LINE.
- Circled numbers refer to waveforms.
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

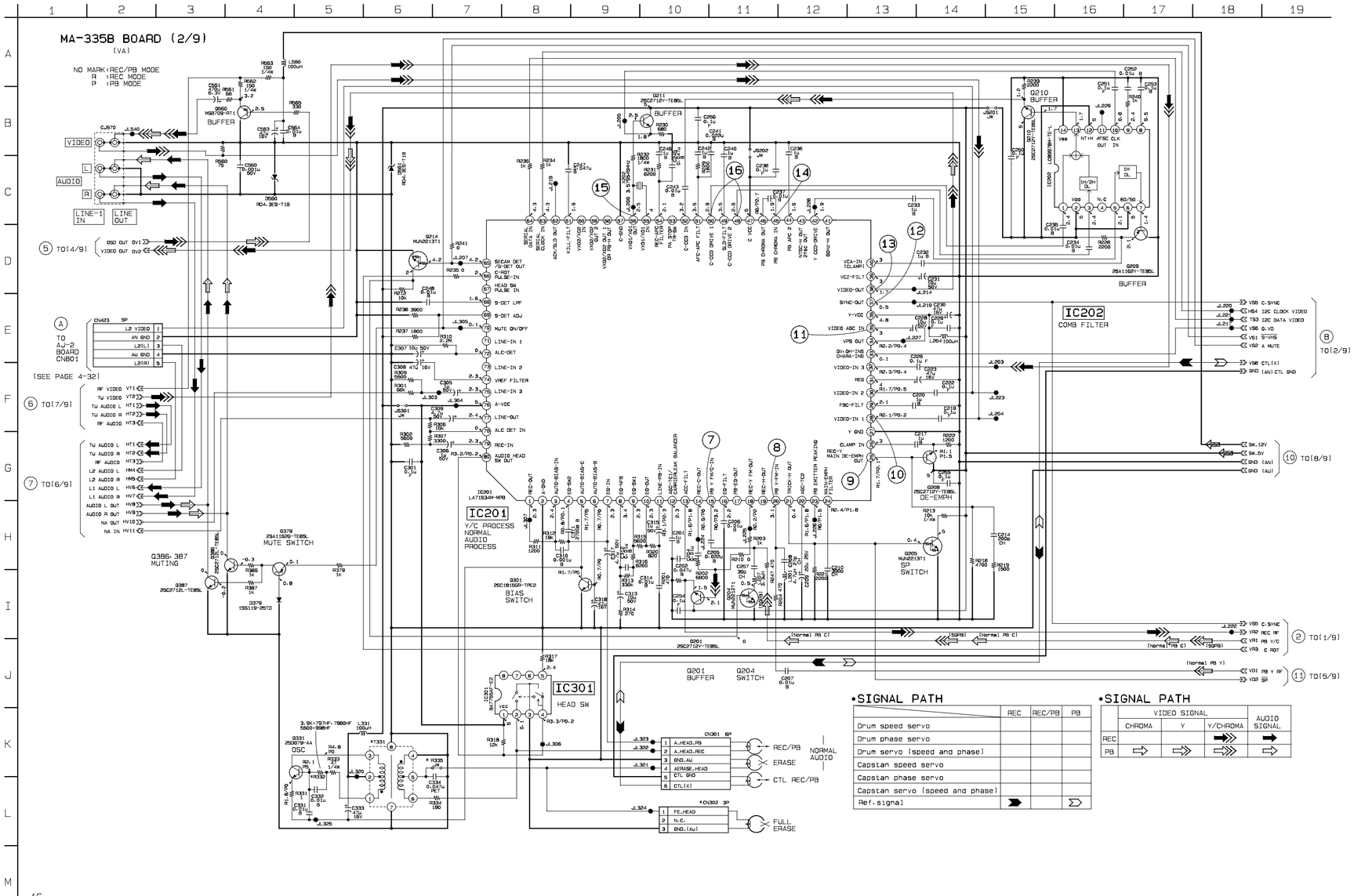
When indicating parts by reference number, please include the board name.

MA-335 (VIDEO, NORMAL AUDIO) SCHEMATIC DIAGRAM
— Ref. No.: MA-335 Board; 1,000 Series —

• See page 4-3 for MA-335 BOARD printed wiring board.

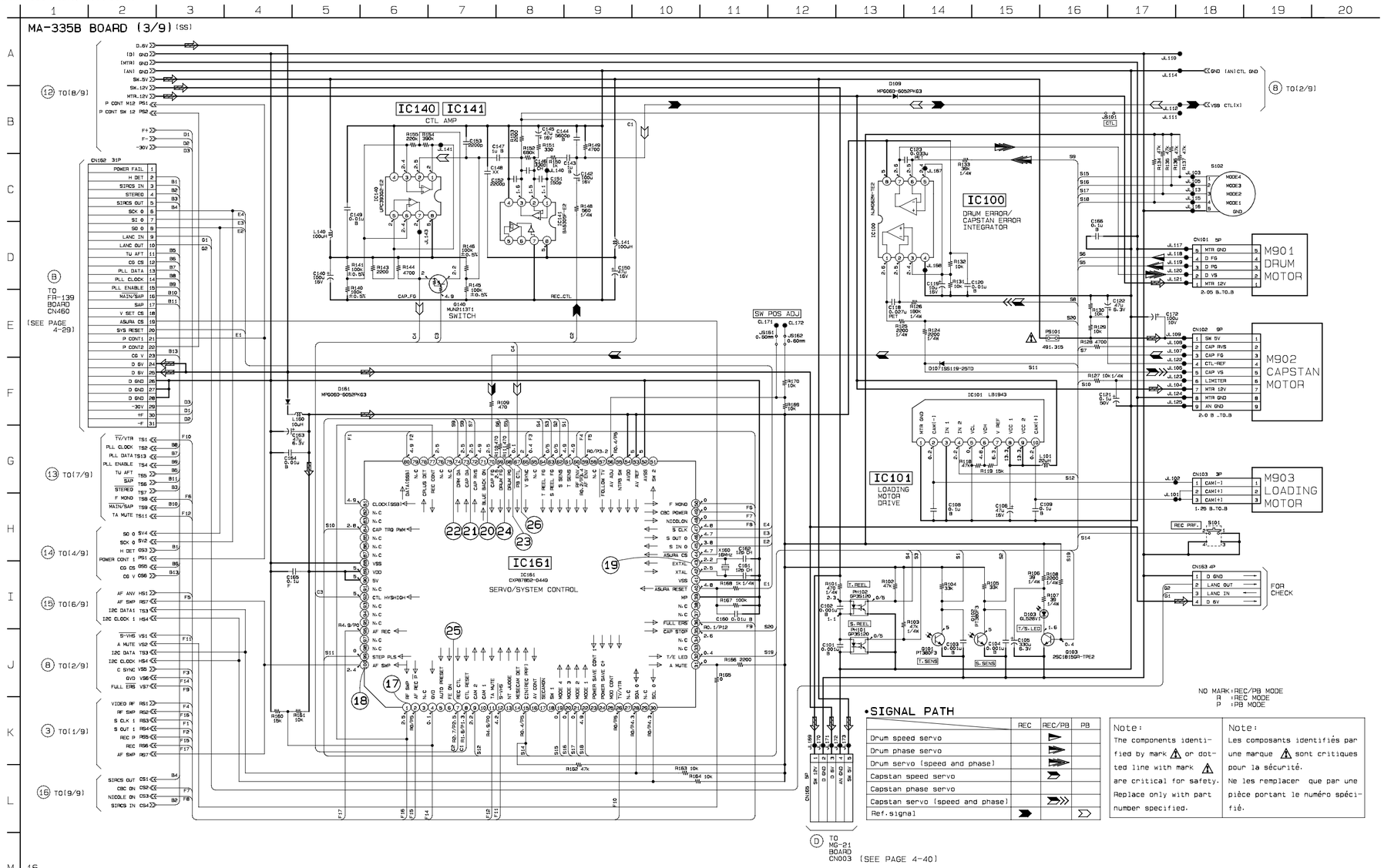
MA-335 BOARD

⑦ IC201 ⑮ PB CN261 ② PB  200mV/Div 0.1µsec/div	⑬ IC201 ㊳ REC/ PB  H 2Vp-p
⑧ IC201 ⑳ PB  0.1V/div 0.1µsec/div	⑭ IC201 ㊺ PB  H 500mVp-p
⑨ IC201 ㉕ REC H 0.5Vp-p	⑮ IC201 ㊻ REC  3.579545MHz 550mVp-p
⑩ IC201 ㉘ REC  H 1Vp-p	⑮ IC201 ㊻ PB  3.579545MHz 500mVp-p
⑪ IC201 ㉟ REC  H 1Vp-p	⑯ IC201 ㊽ REC IC201 ㊿ REC  H 340mVp-p
⑫ IC201 ㊲ REC/PB  H 4Vp-p	⑯ IC201 ㊽ PB IC201 ㊿ PB H 0.23Vp-p



MA-335 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM • See page 4-3 for MA-335 BOARD printed wiring board.

— Ref. No.: MA-335 Board; 1,000 Series —



•SIGNAL PATH

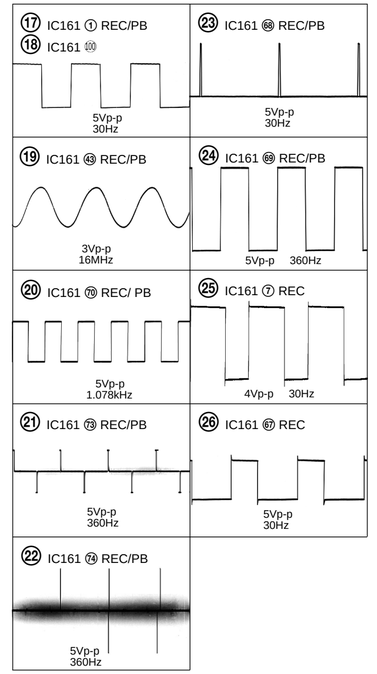
	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶	
Drum servo (speed and phase)		▶	
Capstan speed servo		▶	
Capstan phase servo		▶	
Capstan servo (speed and phase)		▶	▶▶
Ref.signal	▶		▷

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

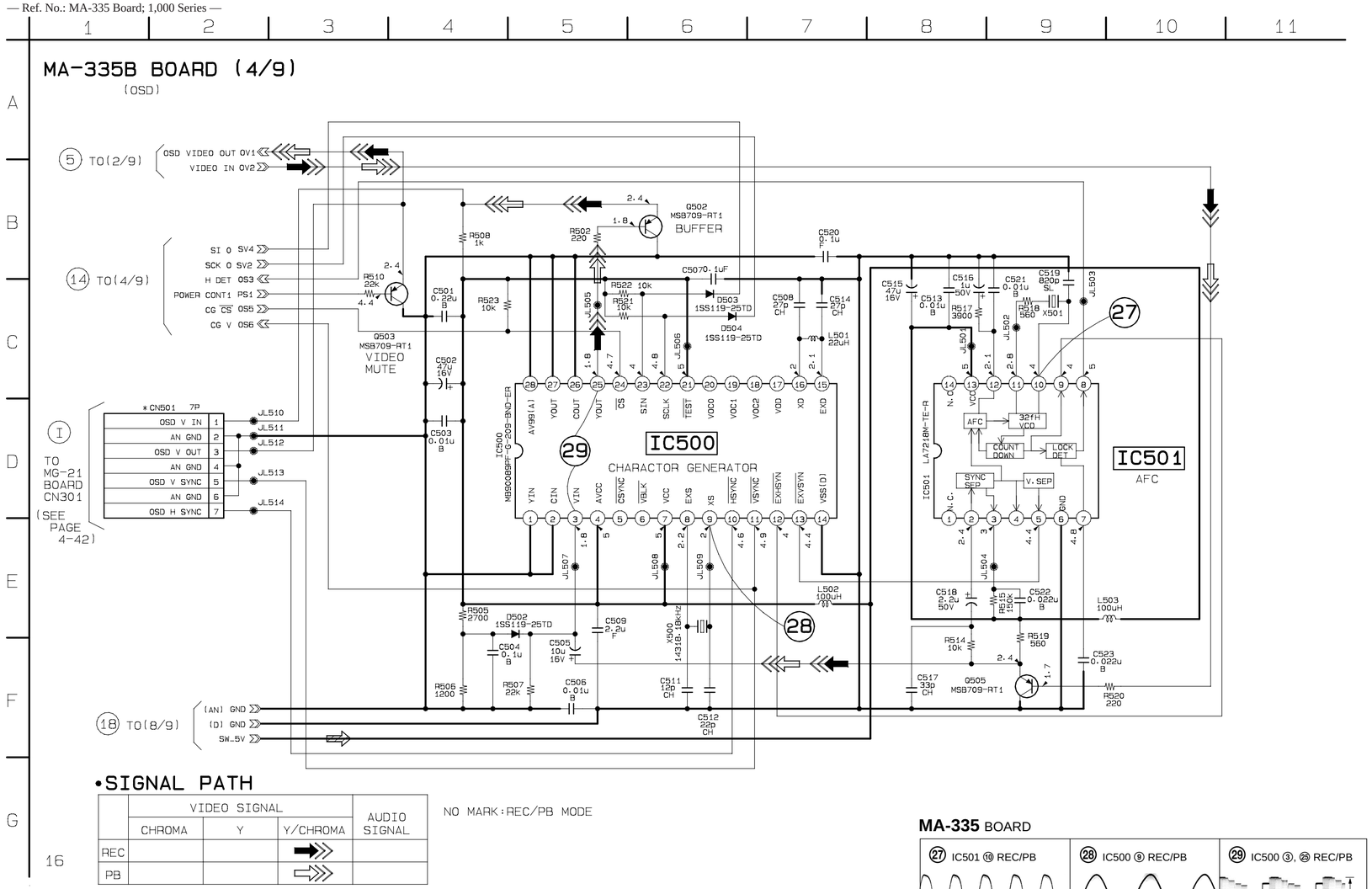
Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MA-335 BOARD



MA-335 (ON SCREEN DISPLAY) SCHEMATIC DIAGRAM
— Ref. No.: MA-335 Board; 1,000 Series —

• See page 4-3 for MA-335 BOARD printed wiring board.

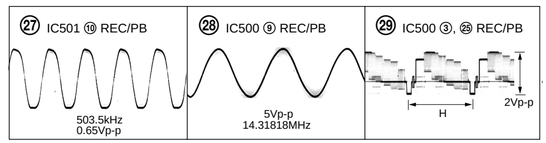


•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	
PB			⇨	

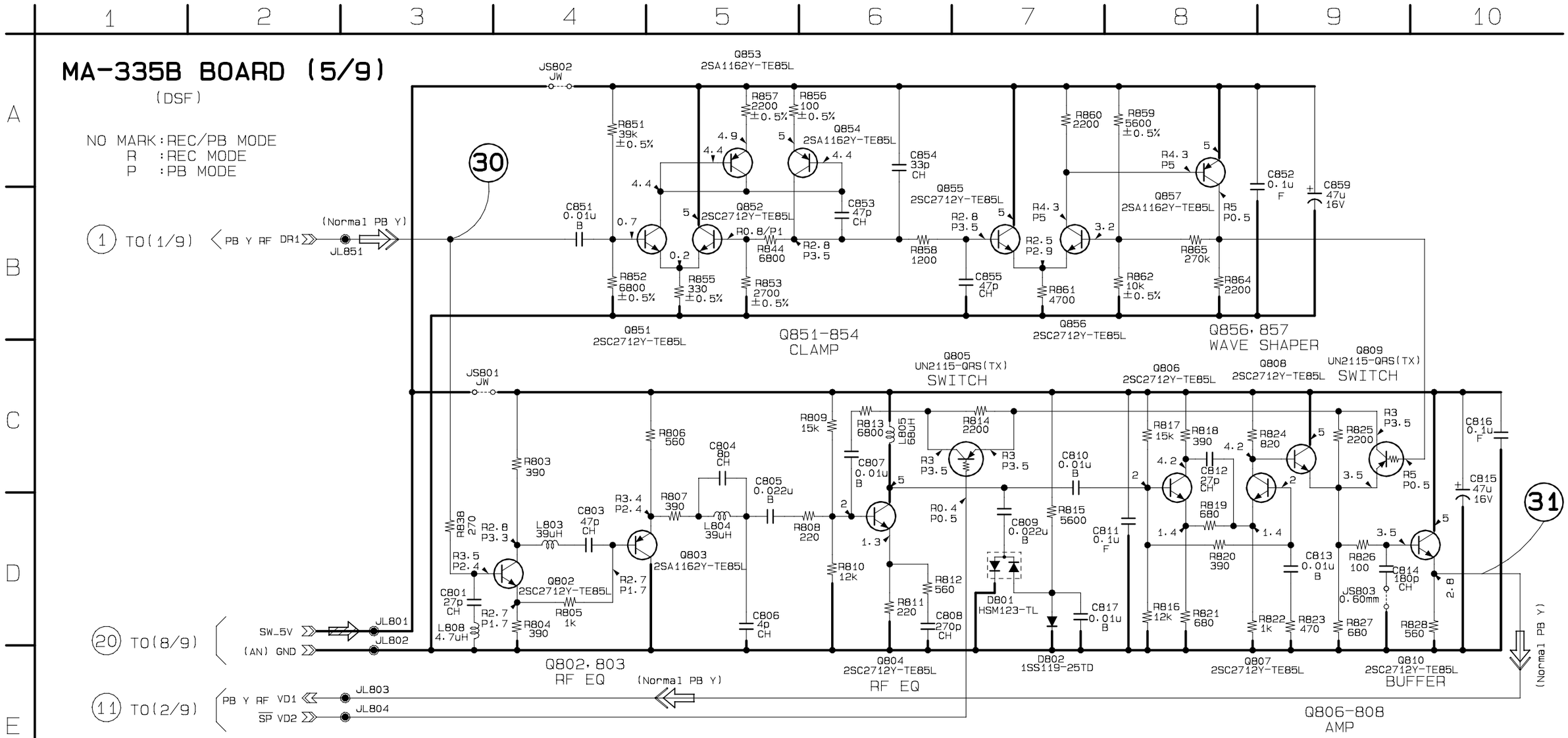
NO MARK:REC/PB MODE

MA-335 BOARD



MA-335 (DSF) SCHEMATIC DIAGRAM
— Ref. No.: MA-335 Board; 1,000 Series —

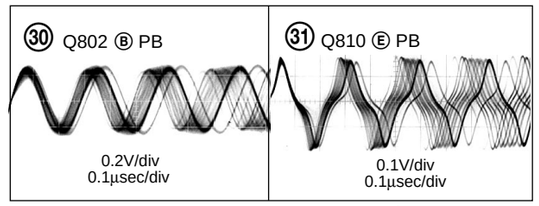
• See page 4-3 for MA-335 BOARD printed wiring board.



•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB		⇨		

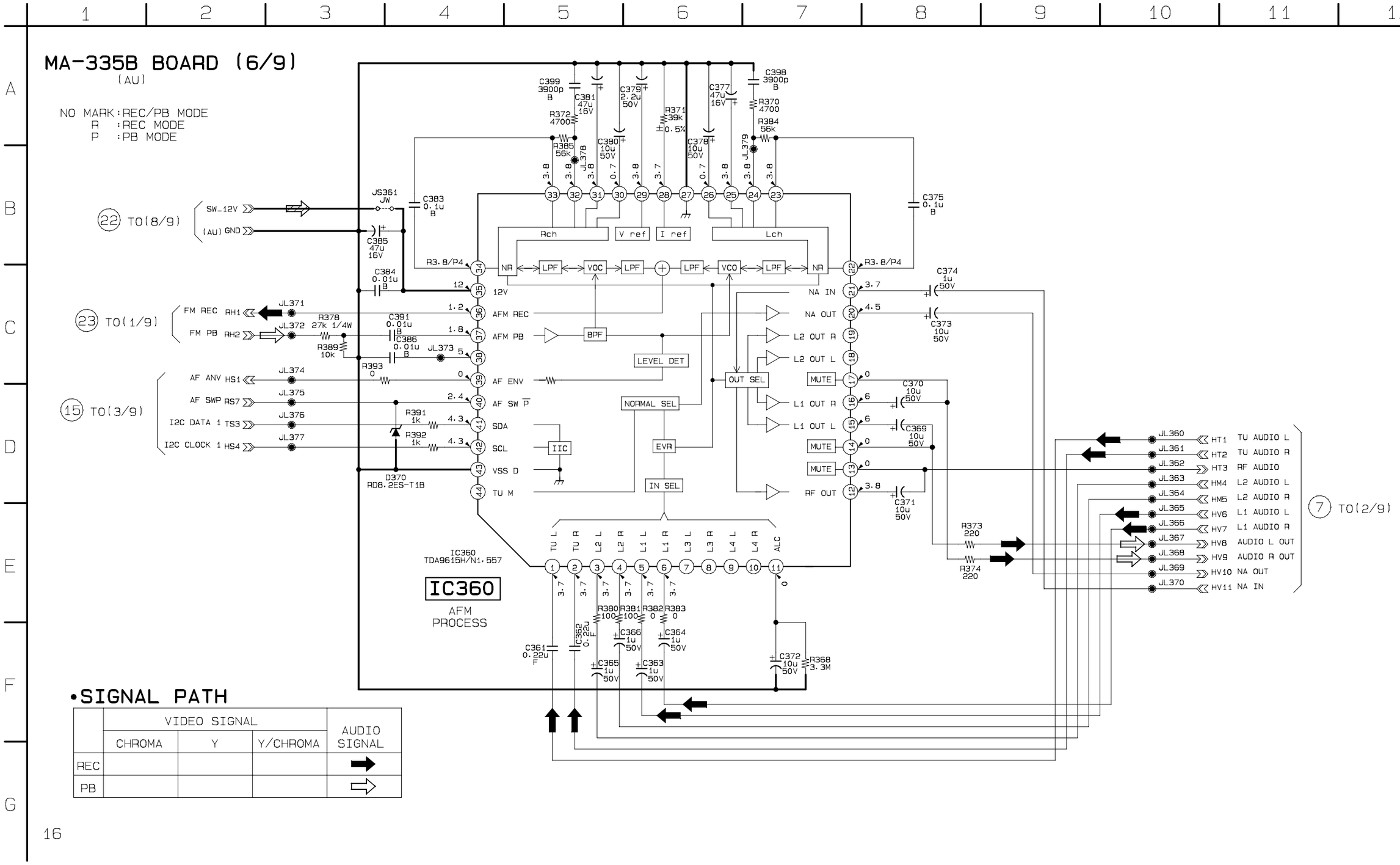
MA-335 BOARD



MA-335 (AFM AUDIO) SCHEMATIC DIAGRAM

— Ref. No.: MA-335 Board; 1,000 Series —

• See page 4-3 for MA-335 BOARD printed wiring board.



•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

MA-335 (TUNER) SCHEMATIC DIAGRAM
— Ref. No.: MA-335 Board; 1,000 Series —

• See page 4-3 for MA-335 BOARD printed wiring board.

MA-335B BOARD (7/9)
(TU)

NO MARK:E-E MODE

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	➡
PB				

TU700 BTF-MA401

A IN, CH SW, 5V, TV/VTR, V IN, 30V, 5V, CLK, DATA, ENABLE, RF AGC, IF, 5V, AFT, GND, MPX OUT, V OUT

IF JS702

6 TO(2/9): RF VIDEO VT1, TU VIDEO IN VT2

C701 47u 16V

RFCH, S701, 3CH, 4CH, D702 RD33ES-T1B

C707 2200p B, R712 0, C709 100u 16V, C710 0.01u B, C712 100u 16V

C735 10u 50V, RV731 47k, R736 0

IC733 ST/BILING PROCESS

IC733 SBX1837-51

JS701 JW

Q731 MUN2213T1 SWITCH

C706 4.7u 50V, R706 470k, L703 2.2uH, L704 47uH, C736 47u 16V, L731 47uH, C704 0.01u B

24 TO(8/9): 30V, SW_5V, (AN) GND

R705 330 1/4W, 33.2

R737 22k, R738 22k, R748 4700, R739 10k 1/4W, R733 4700 1/4W

13 TO(3/9): TV/VTR TS1, PLL CLOCK TS2, PLL DATA TS13, PLL ENABLE TS4, TU AFT TS5, SAP TS6, STEREO TS7, F MONO TS8, MAIN/SAP TS9, TA MUTE TS11

R701 1k, R709 0, R710 0, R711 0, R731 1k, R732 1k, R749 1k, R735 1k

6 TO(2/9): TU AUDIO L HT1, TU AUDIO R HT2, RF AUDIO HT3

R702 3300

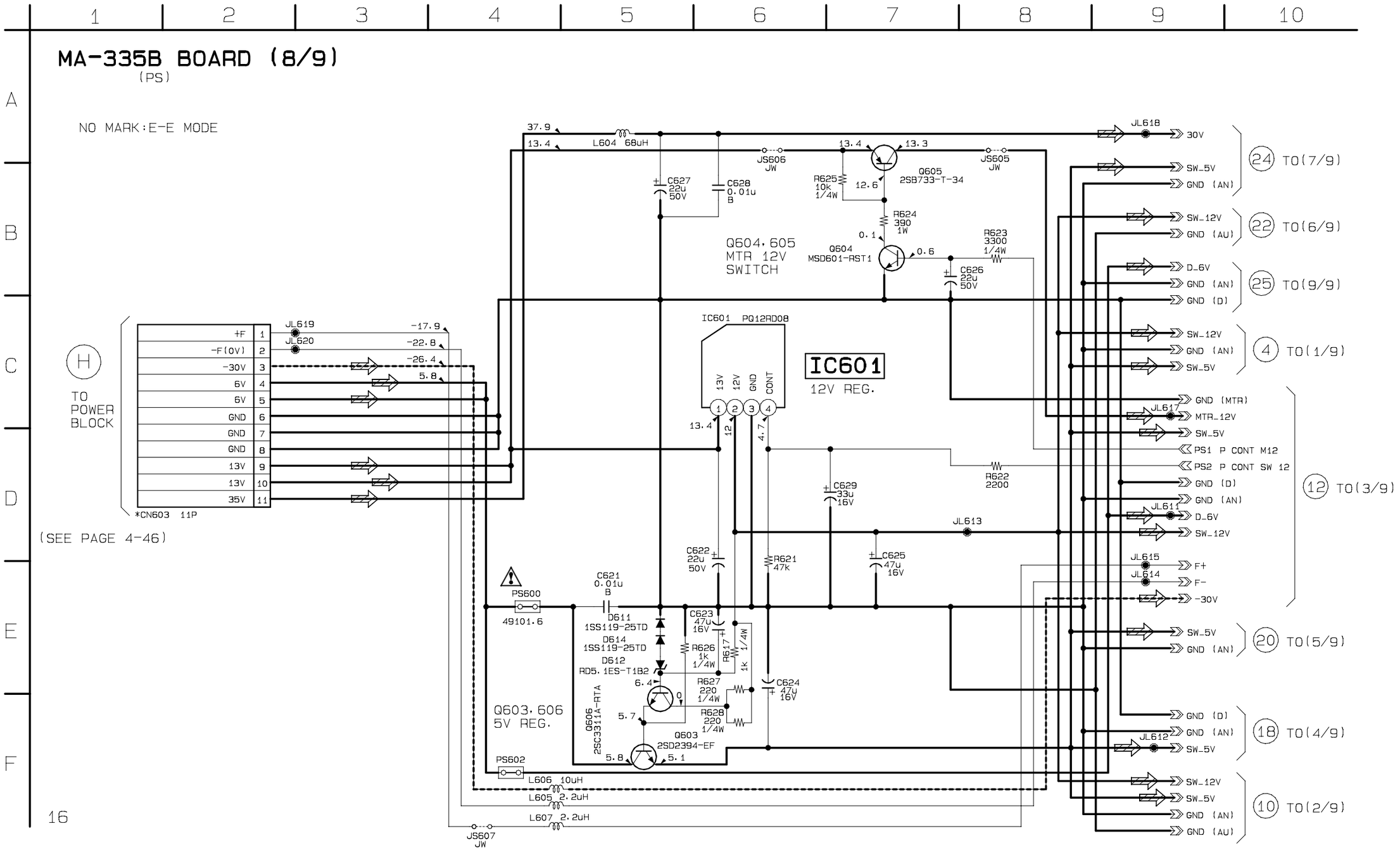
JL731 GND, JL732 2.4 MPX IN, JL733 5 ST IND, JL734 5 SAP IND, JL735 4.9 MS1, JL736 0 MS0, JL737 0 F MONO, F SAP, JL738 4.9 MUTE, JL739 2.5 R OUT, JL740 2.5 L OUT, L+R OUT, JL741 4.8 VCC

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MA-335 (POWER SUPPLY) SCHEMATIC DIAGRAM

— Ref. No.: MA-335 Board; 1,000 Series —

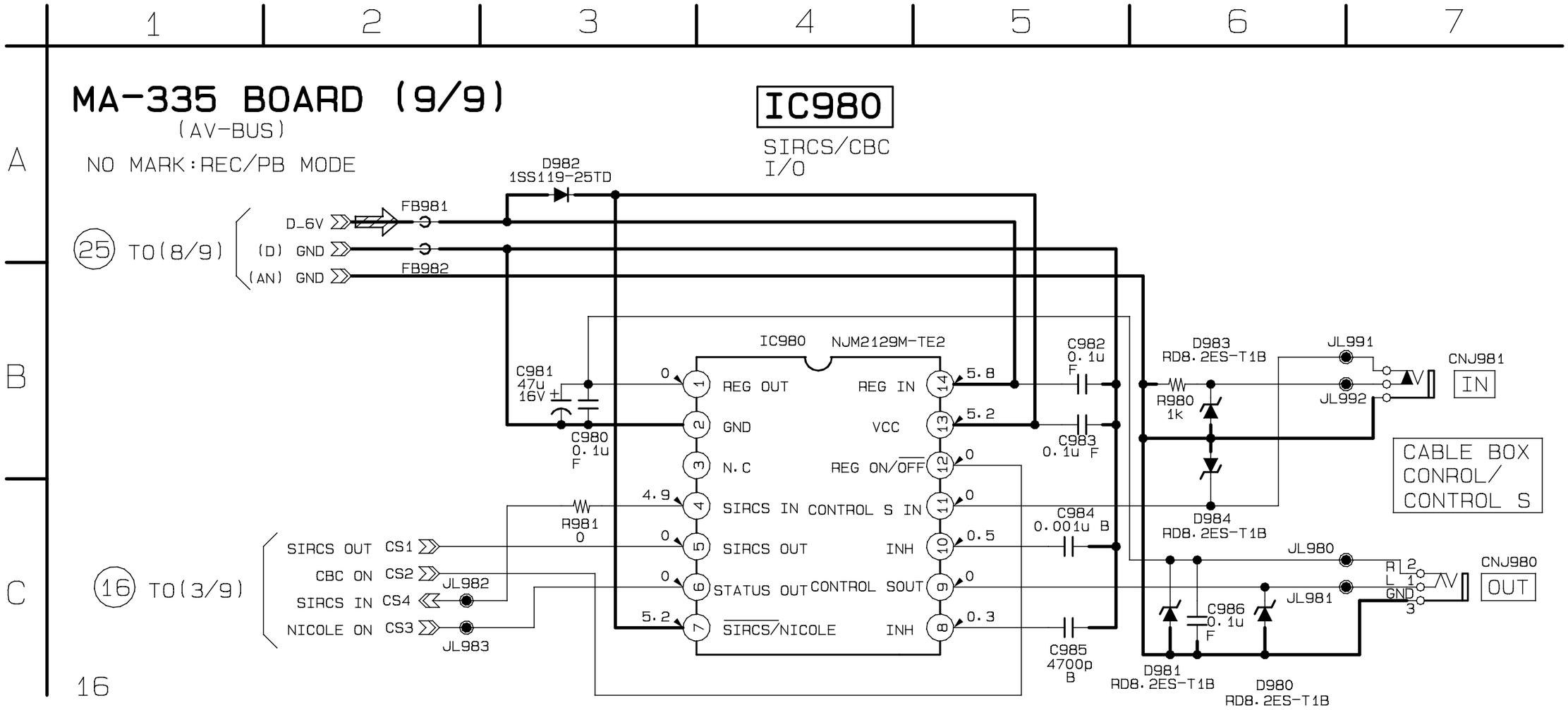
• See page 4-3 for MA-335 BOARD printed wiring board.



Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MA-335 (AV-BUS) SCHEMATIC DIAGRAM
— Ref. No.: MA-335 Board; 1,000 Series —

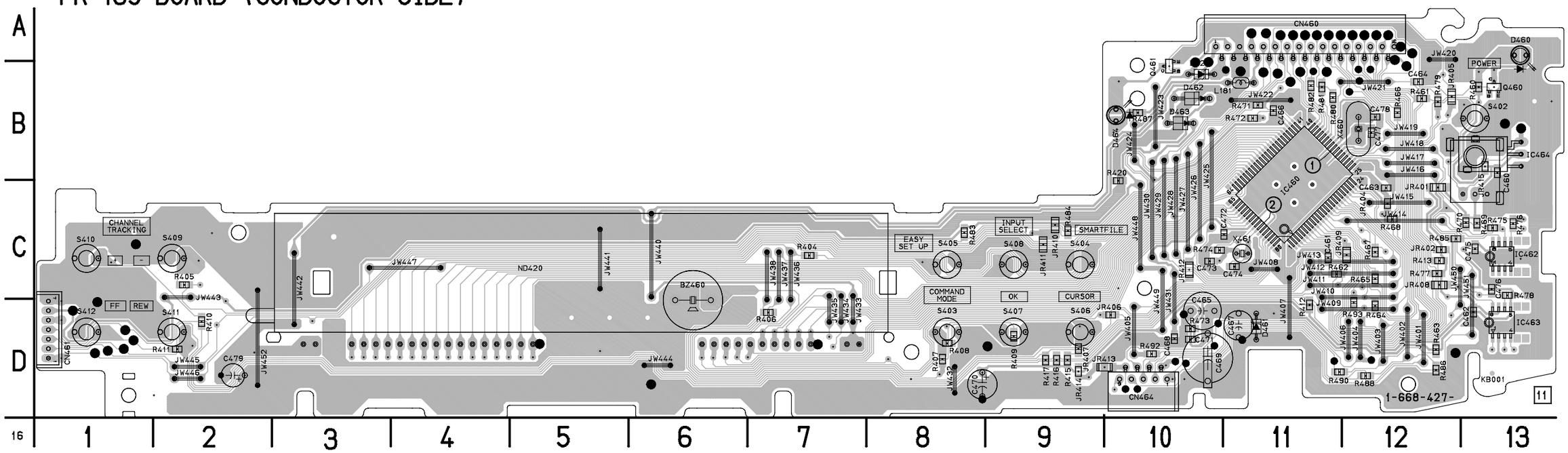
• See page 4-3 for MA-335 BOARD printed wiring board.

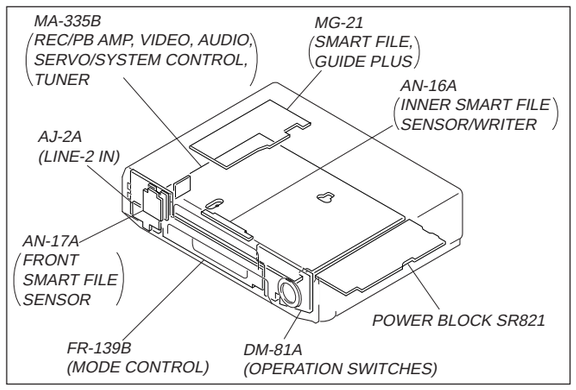


FR-139 (MODE CONTROL) PRINTED WIRING BOARD
— Ref. No.: FR-139 Board; 2,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

FR-139 BOARD (CONDUCTOR SIDE)

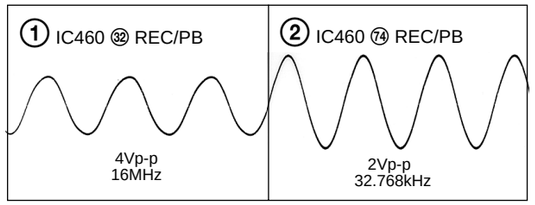




FR-139 BOARD

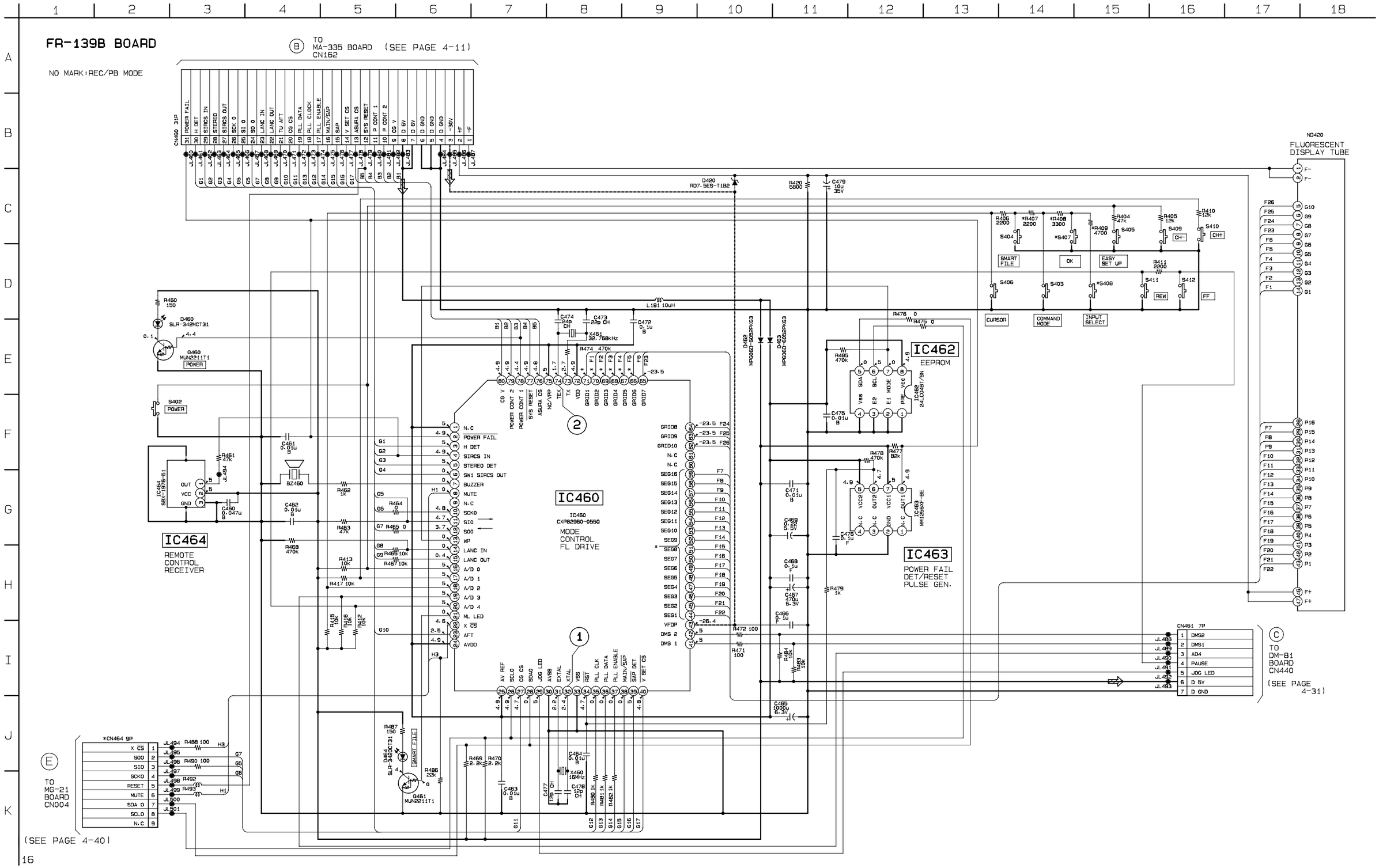
CN460	A-11
CN461	D-1
CN464	D-10
D420	B-10
D460	A-13
D462	B-10
D463	B-10
D464	B-10
IC460	B-11
IC462	C-13
IC463	D-13
IC464	B-13
Q460	B-13
Q461	A-10

FR-139 BOARD



FR-139 (MODE CONTROL) SCHEMATIC DIAGRAM

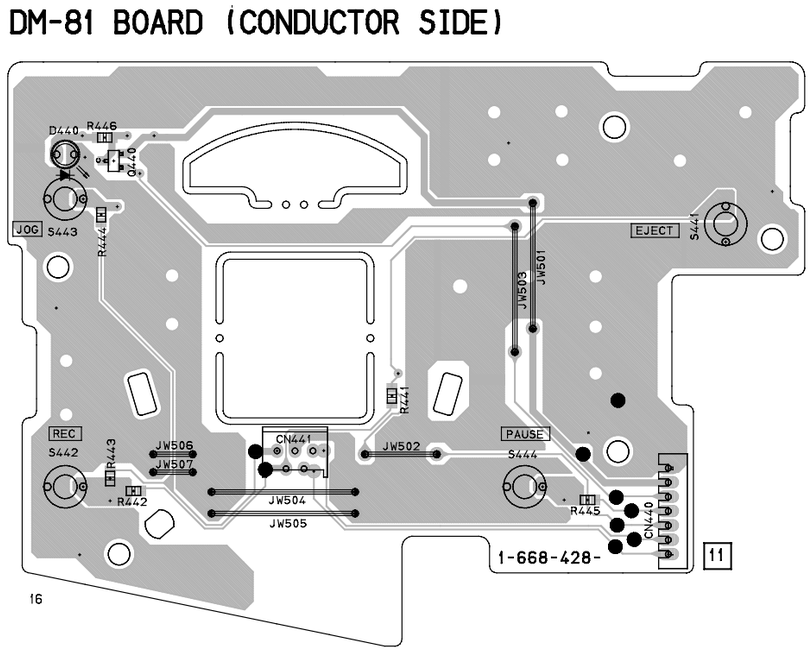
— Ref. No.: FR-139 Board; 2,000 Series —

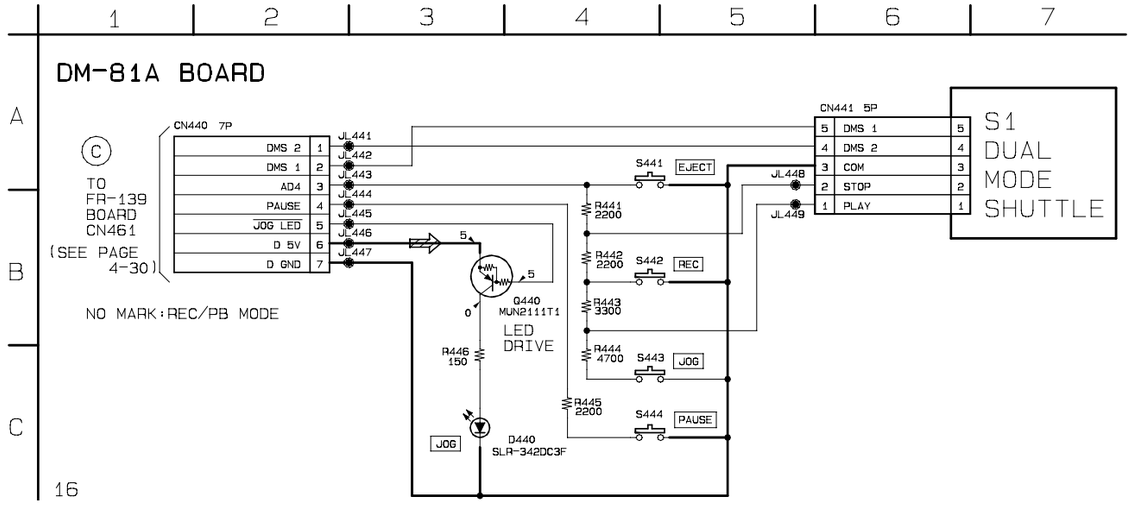


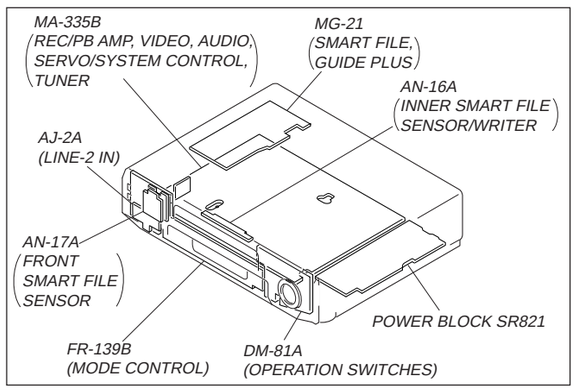
There are few cases that the part printed on this diagram isn't mounted in this model.

DM-81 (OPERATION SWITCHES) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No.: DM-81 Board; 2,000 Series —





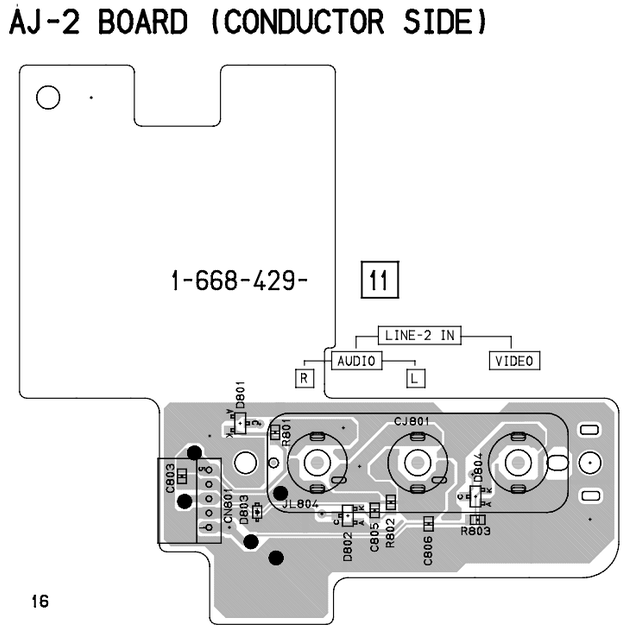


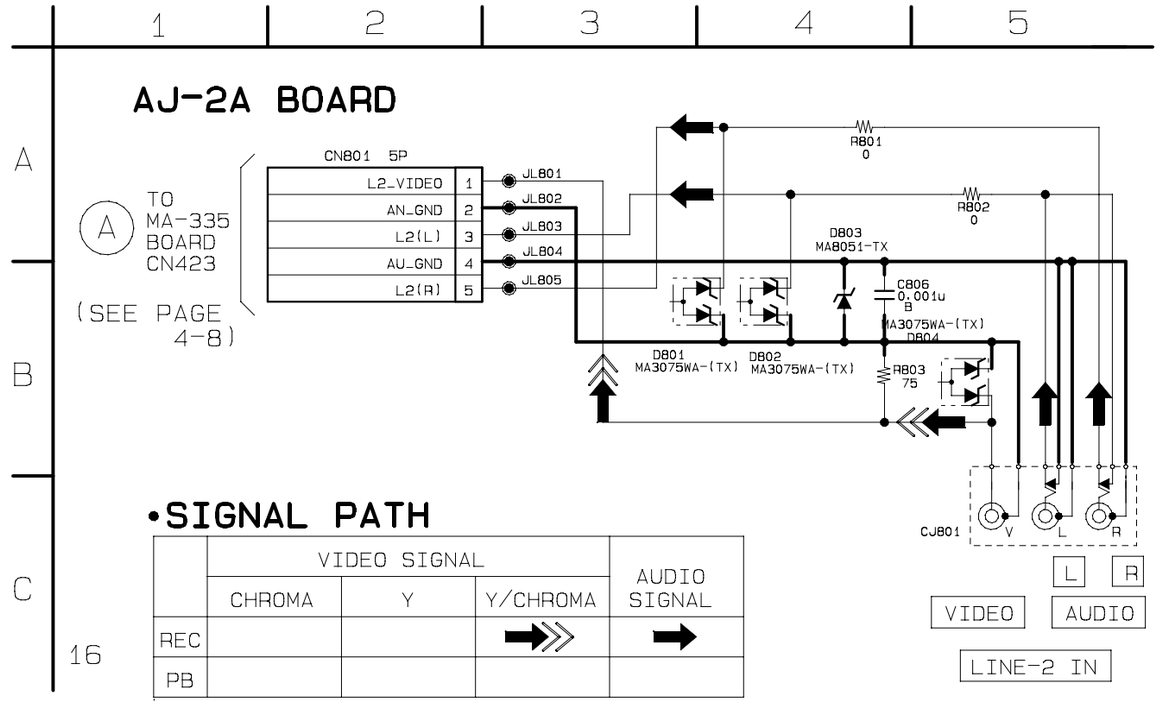
OPERATION SWITCHES / **LINE-2 IN**
DM-81 **AJ-2**

There are few cases that the part printed on this diagram isn't mounted in this model.

AJ-2 (LINE-2 IN) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No.: AJ-2 Board; 3,000 Series —





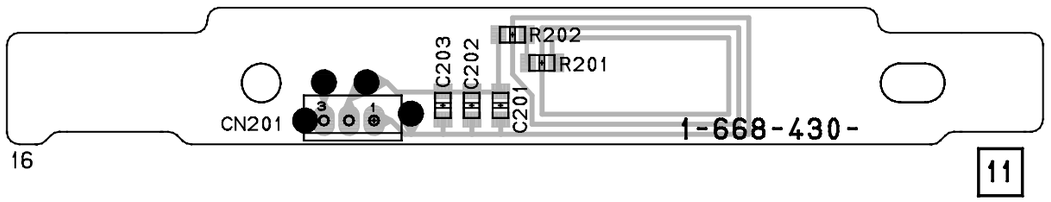
•SIGNAL PATH

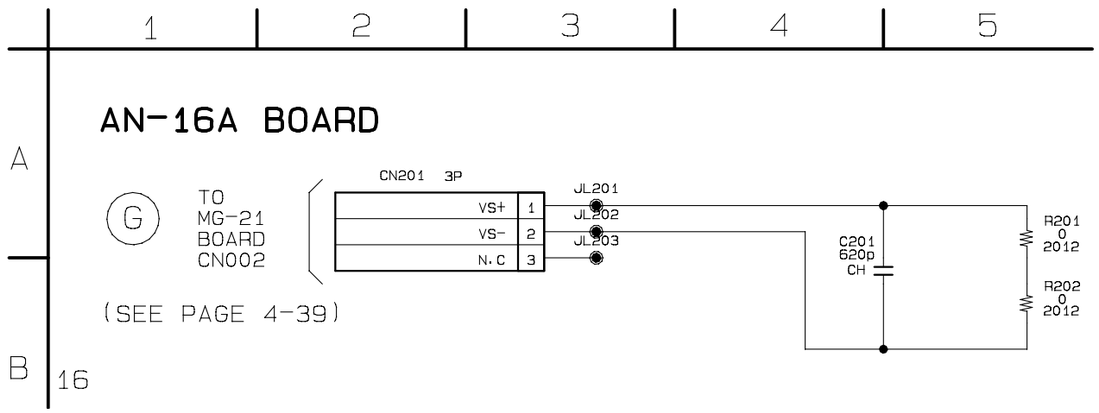
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			⇉	→
PB				

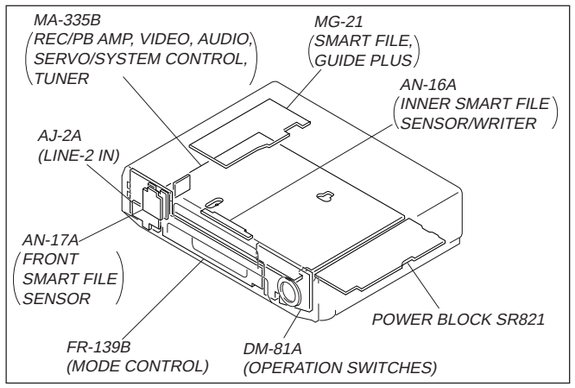
AN-16 (INNER SMART FILE SENSOR/WRITER), AN-17 (FRONT SMART FILE SENSOR) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS
— Ref. No.: AN-16, AN-17 Board; 3,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

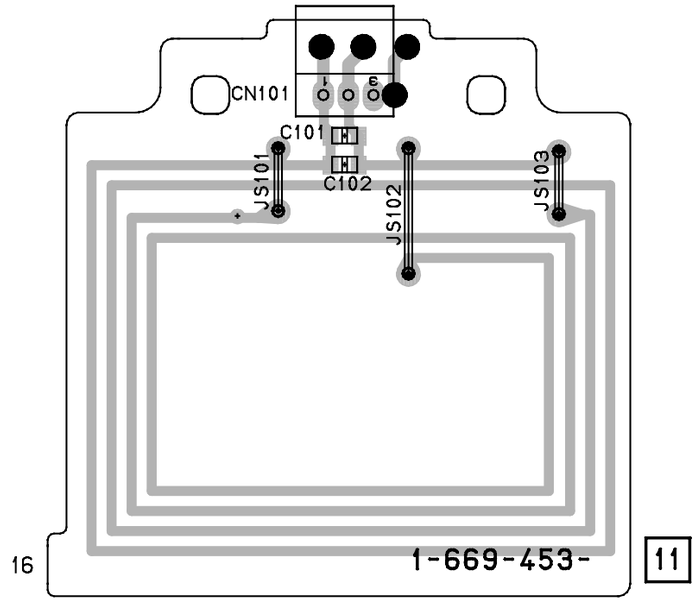
AN-16 BOARD (CONDUCTOR SIDE)

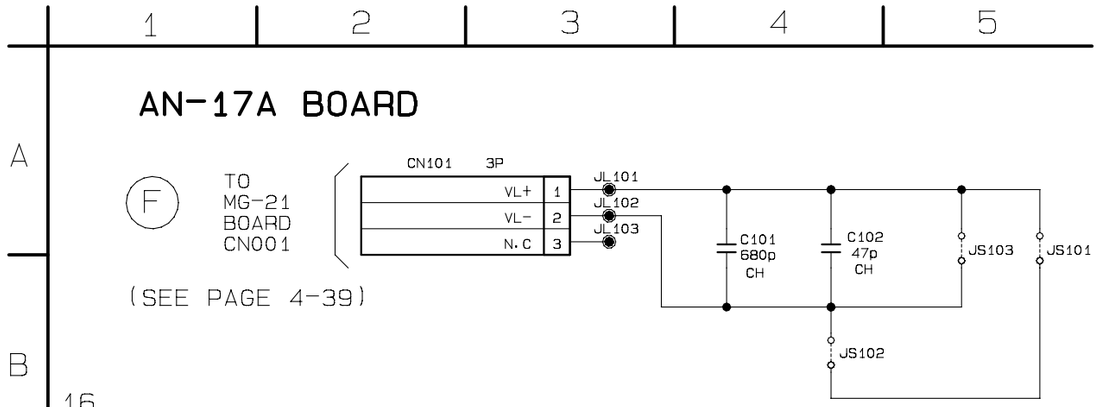






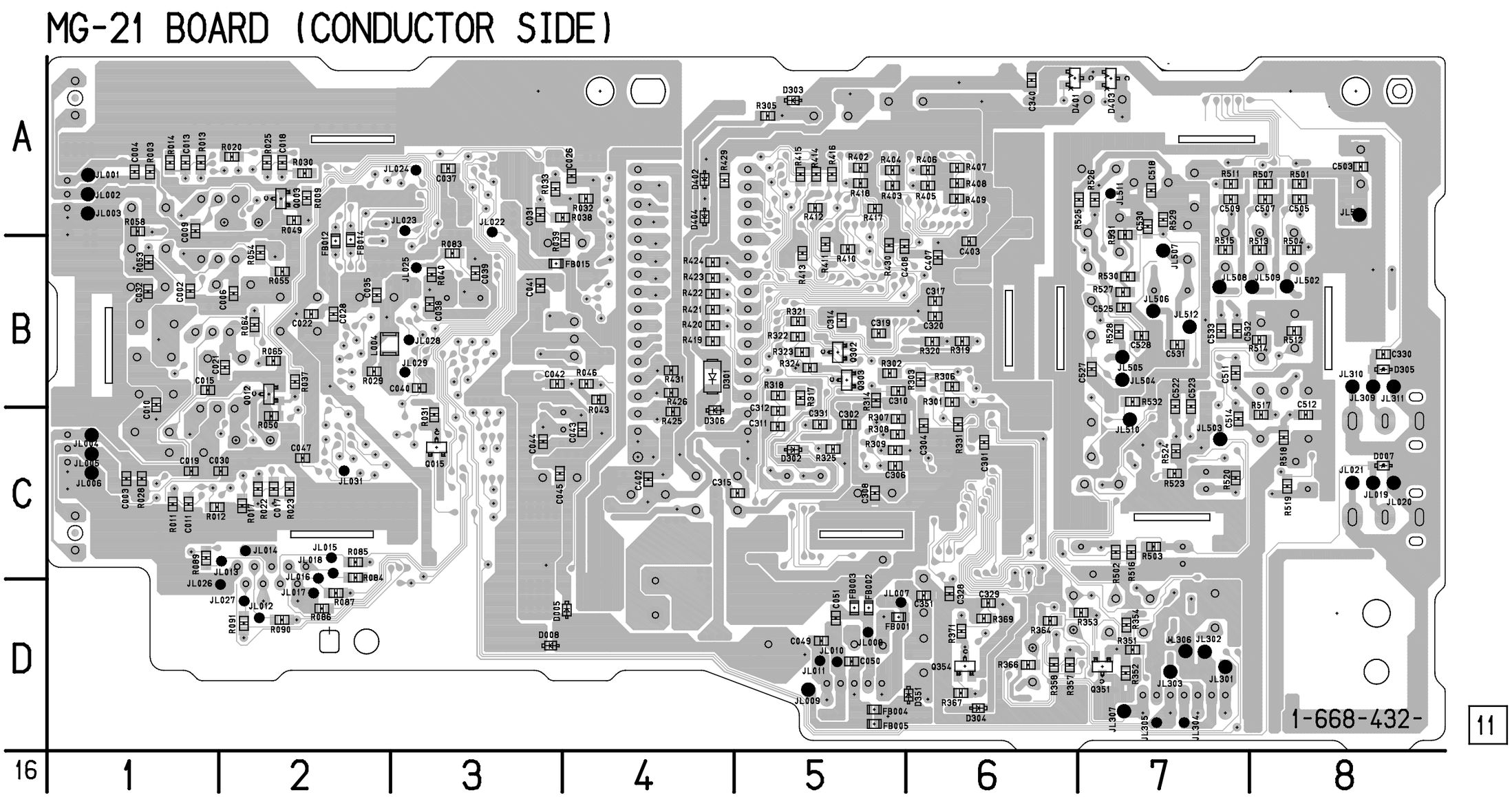
AN-17 BOARD (CONDUCTOR SIDE)

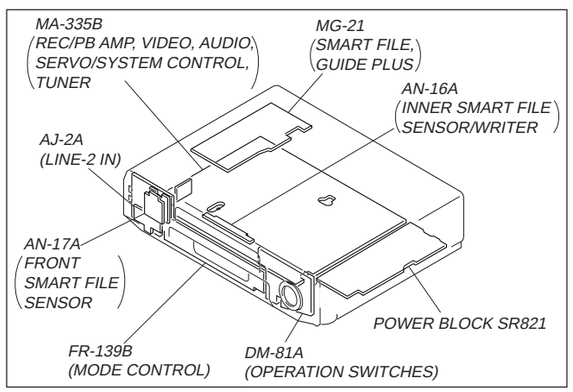




MG-21 (CONDUCTOR SIDE) (SMART FILE) PRINTED WIRING BOARD
— Ref. No.: MG-21 Board; 3,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.





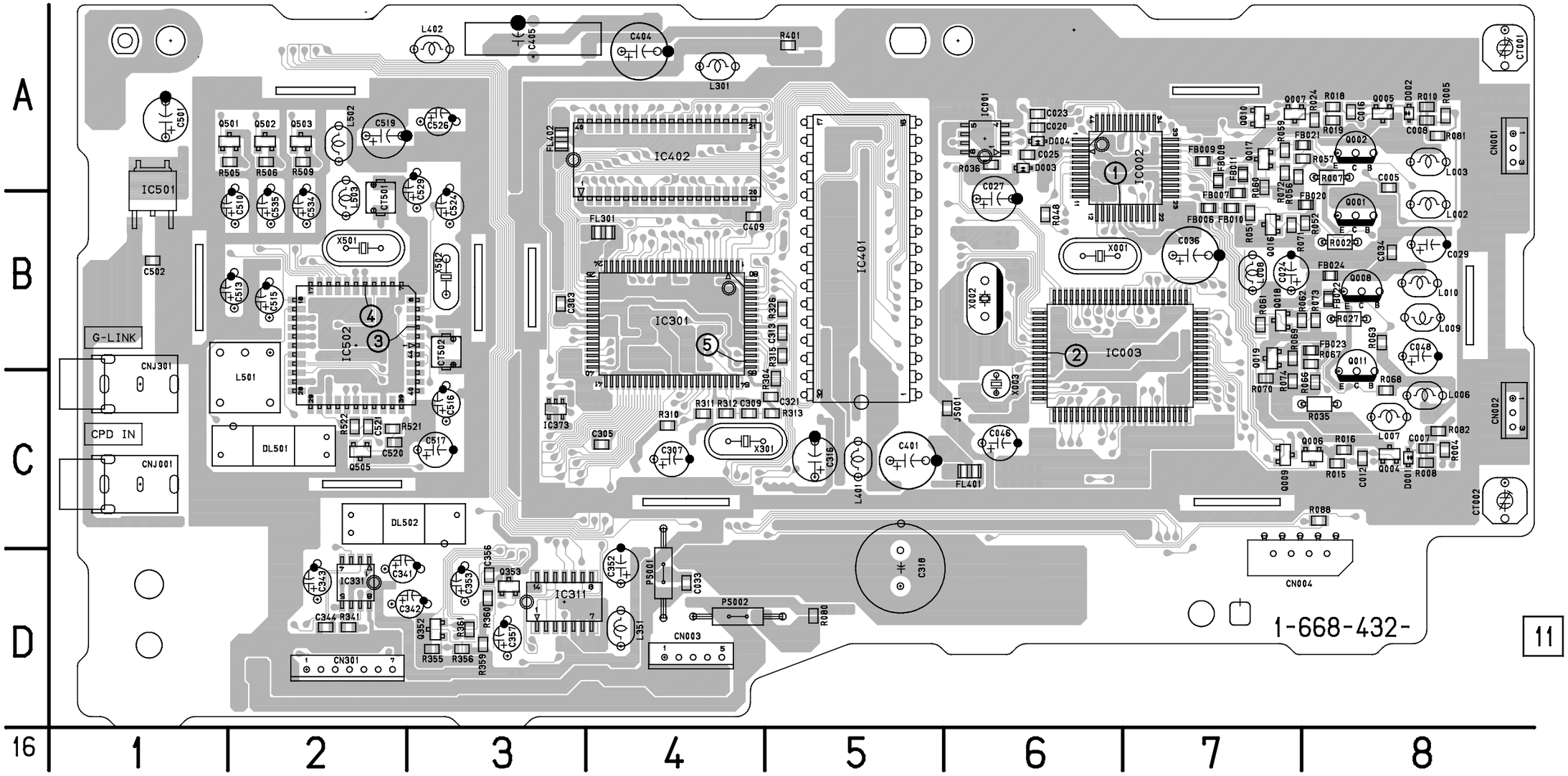
MG-21 BOARD (CONDUCTOR SIDE)

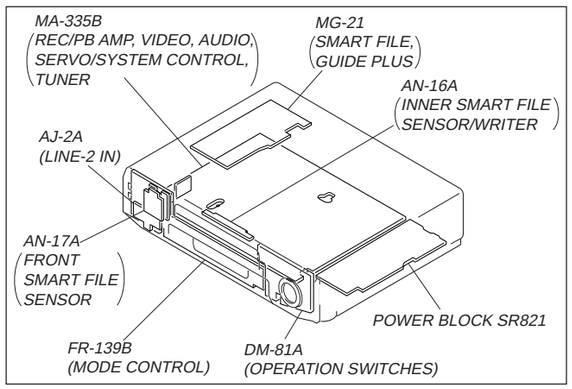
D005	D-3	Q003	A-2
D007	C-8	Q012	B-2
D008	D-3	Q015	C-3
D303	A-5	Q302	B-5
D304	D-6	Q351	D-7
D305	B-8	Q354	D-6
D306	C-4		
D351	D-6		
D401	A-6		
D402	A-4		
D403	A-7		
D404	A-4		

MG-21 (COMPONENT SIDE) (SMART FILE) PRINTED WIRING BOARD
— Ref. No.: MG-21 Board; 3,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

MG-21 BOARD (COMPONENT SIDE)



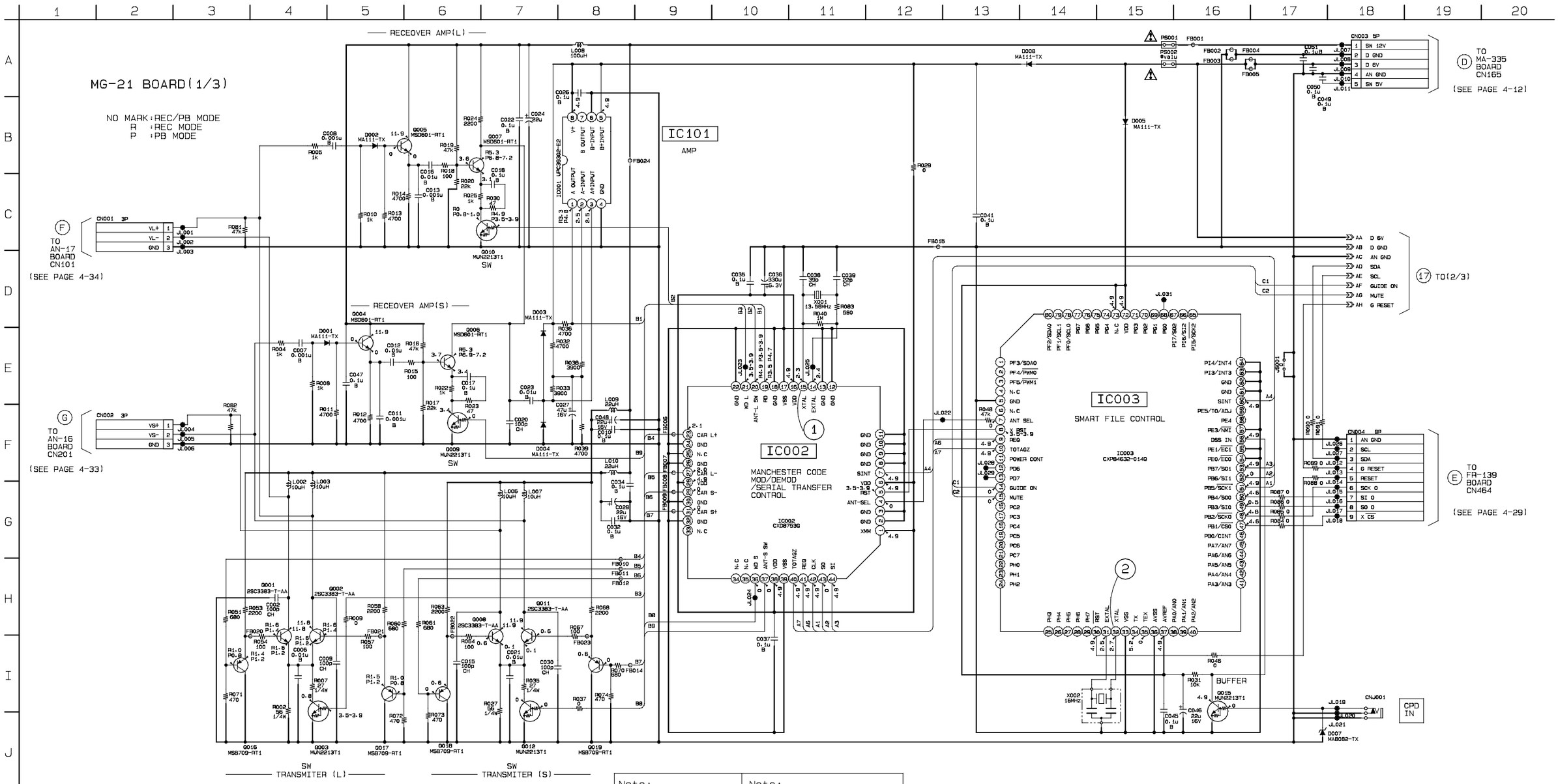


MG-21 BOARD (COMPONENT SIDE)

CN001	A-8	IC311	D-3	Q009	C-7
CN002	C-8	IC331	D-2	Q010	A-7
CN003	D-4	IC373	C-3	Q011	B-8
CN004	D-8	IC401	B-5	Q016	B-8
CN301	D-2	IC402	A-4	Q017	A-7
		IC501	A-1	Q018	B-7
D001	C-8	IC502	B-2	Q019	B-7
D002	A-8			Q352	D-3
D003	A-6	Q001	B-8	Q353	D-3
D004	A-6	Q002	A-8	Q505	C-2
		Q004	C-8		
IC001	A-6	Q005	A-8		
IC002	A-7	Q006	C-8		
IC003	B-7	Q007	A-8		
IC301	B-4	Q008	B-8		

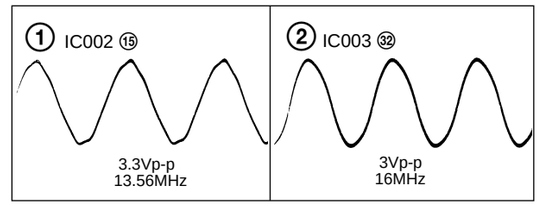
MG-21 (SMART FILE) SCHEMATIC DIAGRAM

— Ref. No.: MG-21 Board; 3,000 Series —



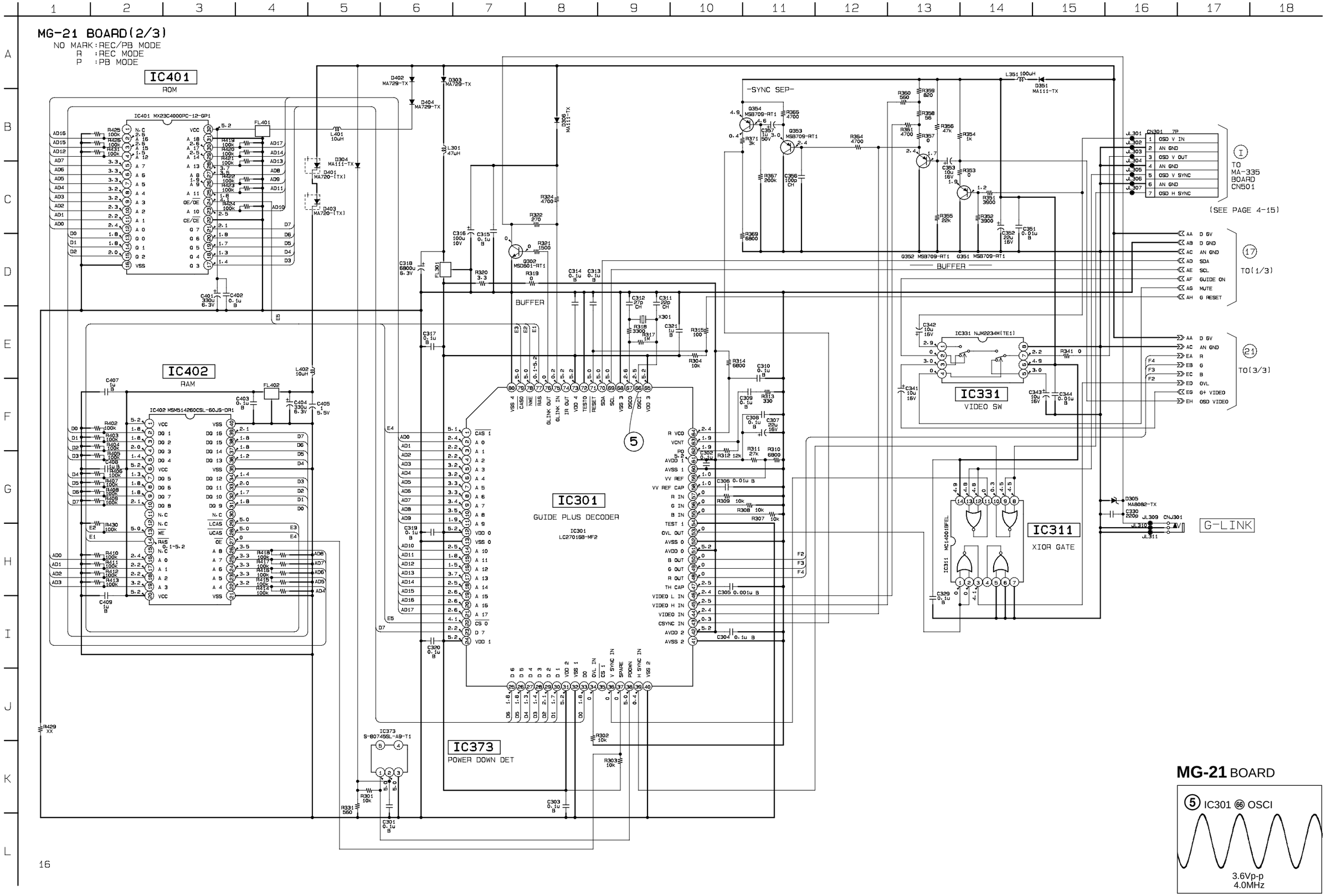
Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

MG-21 BOARD



MG-21 (GUIDE PLUS) (SMART FILE) SCHEMATIC DIAGRAM

— Ref. No.: MG-21 Board; 3,000 Series —

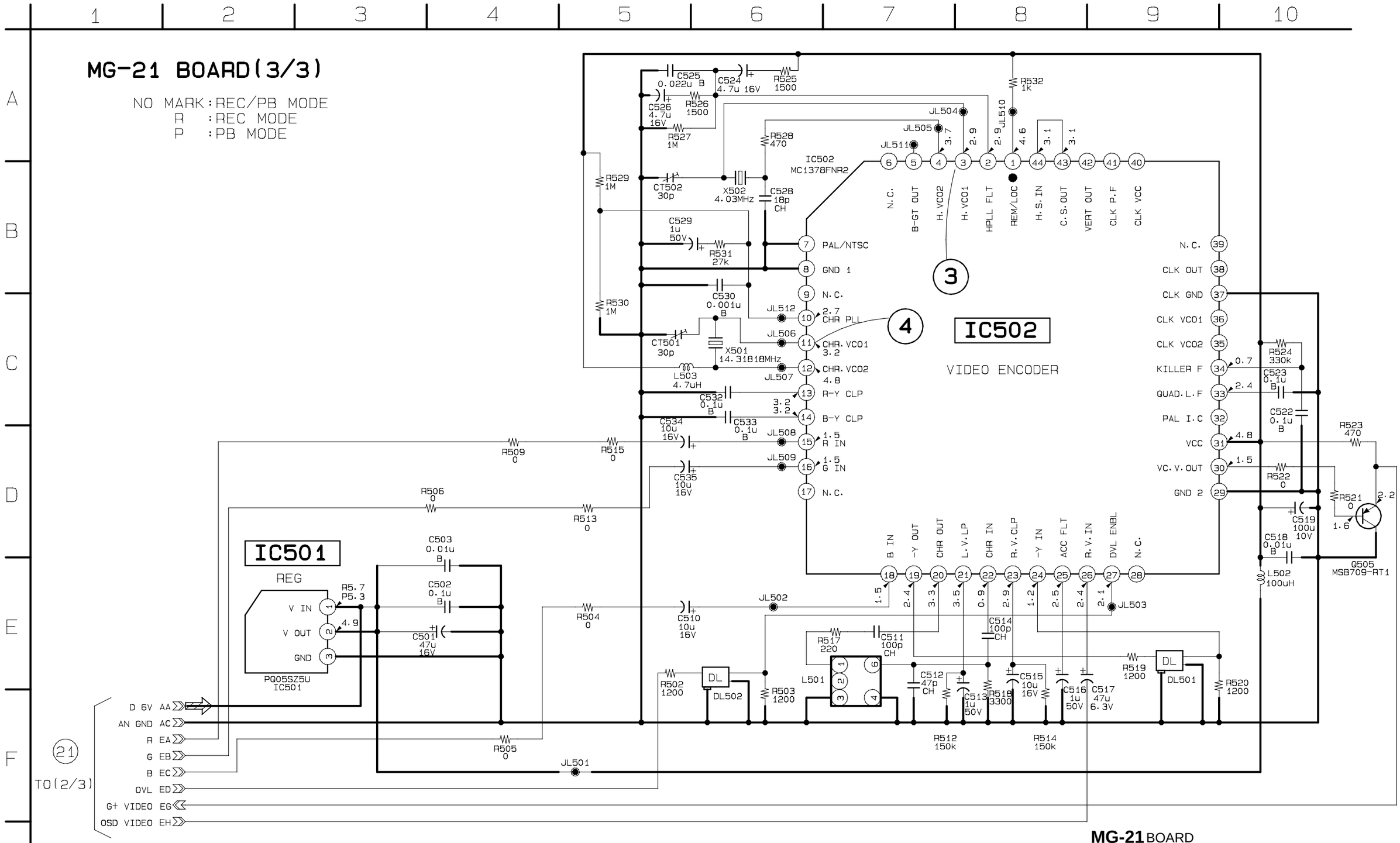


MG-21 (VIDEO ENCODER) (SMART FILE) SCHEMATIC DIAGRAM

— Ref. No.: MG-21 Board; 3,000 Series —

MG-21 BOARD(3/3)

NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE



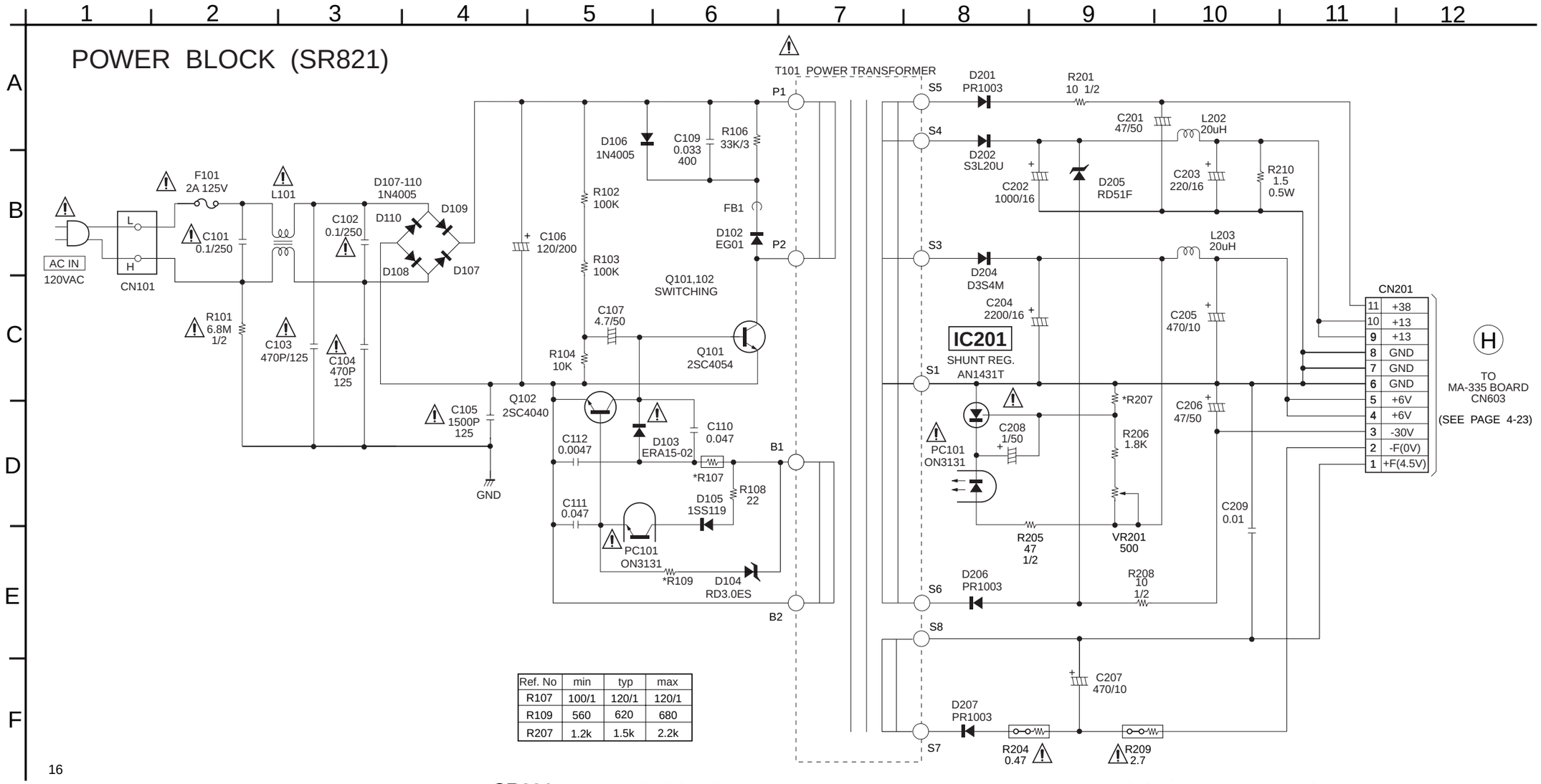
MG-21 BOARD

③ IC502 ③ H.VCO1	④ IC502 ⑪ CHR.VCO1
0.4Vp-p 4.03MHz	40mVp-p 14.31818MHz

POWER BLOCK SR821 (SWITCHING REGULATOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

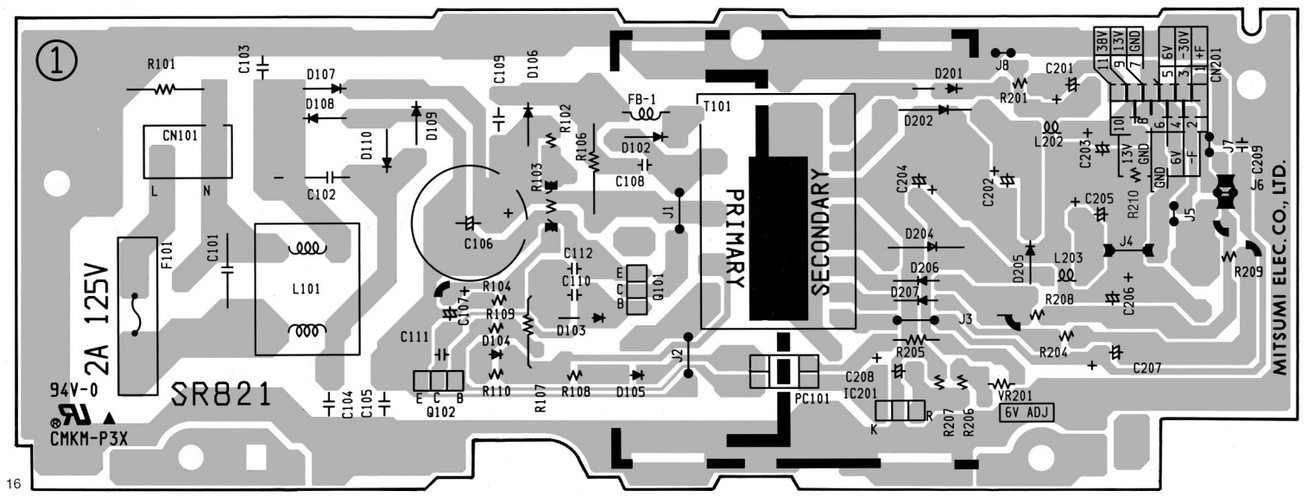
— Ref. No.: SR821 Board; 9,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.



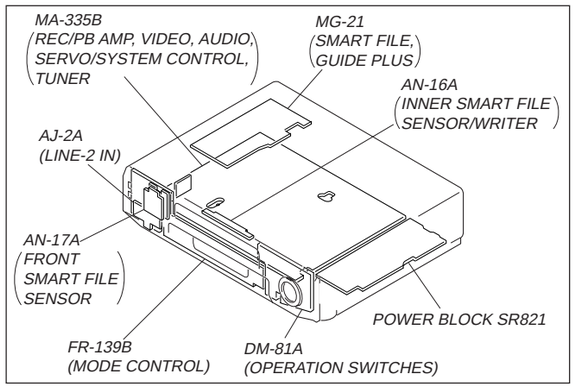
Ref. No	min	typ	max
R107	100/1	120/1	120/1
R109	560	620	680
R207	1.2k	1.5k	2.2k

SR821 (CONDUCTOR SIDE)



Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.



5-1. SYSTEM CONTROL — VIDEO BLOCK INTERFACE (MA-335 BOARD IC161)

Signal	Pin No.	I/O	STOP FF/REW	TAPE THREADING	TAPE UNTHREADING	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
RF SWP	①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	④	O	L	L	L	*2	*3	*3	*2	*3	*3	L	L
V SYNC	⑯	I	*4	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
NT JUDGE	⑬	O	L	L	L	L	L	L	L	L	L	L	L

*1 Synchronized with drum rotation. 30Hz 50% duty cycle.
*2 Normally “L“. “H“ when CTL signal is not generated.
*3 V period “H“ pulse.
*4 Selected by REC mode. “H“ in LP mode.“
*5 Composite sync signal (positive).

5-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-335 BOARD IC161)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREADING	PB	PB PAUSE	SLOW	CUE	x 2	REVIEW	REC	REC PAUSE
REC CTL	⑦	O	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*1	Hi-Z
CAP STOP	㉟	O (O.D)	L	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	L	*3	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)
STEP PLS	㊴	O	L	L	L	L	L	L	L	*2	L	L	L	L	L
PB CTL	㊼	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H
DRM PG	㊽	I	*4	*1	*1	*5	*5	*1	*1	*1	*1	*1	*1	*1	*1
DRM FG	㊾	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7
CAP FG	㊿	I	H/L	*6	*6	*5	*5	*6	H/L	*2	*6	*6	*6	*6	H/L
CAP DA	㊸	O	*8	*8	*8	*8	*8	*9	*8	*8	*9	*8	*9	*9	*8
DRM DA	㊹	O	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10
CTL RESET	⑧	I/O	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*11	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z

*1. 30Hz pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. “L” when drum rotation stops.
*5. Unstable period pulse.
*6. Pulse in period in proportional to tape speed.
*7. 360Hz pulse.
*8. Pulse at tape running.
*9. Approx. 2 msec period “H” or “L” pulse.
*10. Approx. 1.5 msec period “H” or “L” pulse.
*11. “L” when FWD SLOW, “H” when RVS SLOW.

5-3. SYSTEM CONTROL — MECHANISM INTERFACE (MA-335 BOARD IC161)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
CAM2	⑨	HI-Z	L	H	L	H	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
MODE 1 (*8)	㉒	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2 (*8)	㉑	I	H	L	L	*1	*1	H	H	H	L	L	L	L	L	L	L	L
MODE 3 (*8)	⑳	I	L	L	L	*1	*1	H	L	L	L	L	L	L	L	H	L	L
MODE 4 (*8)	⑲	I	L	H	H	*1	*1	L	H	H	H	L	L	L	L	L	L	L
(IN REC PRF)	⑮	I	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL FG	㊹	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL FG	㊸	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
$\overline{\text{CAP STOP}}$	㉟	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	㉜	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
T SENS	㊶	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	㊷	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainly.
*2. "L" when erasing protection tab is bent. "H" when not bent.
*3. Pause of period in proportion to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse at tape running.
*6. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.
*7. When transition to UNLOADING direction : "L".
When transition to LOADING direction : "H".
When CAM MOTOR is stopped : Hi-Z.
*8. When RVS slow : Mode 1="L"
When RVS slow : Mode 2="L"
When RVS slow : Mode 3="H"
When RVS slow : Mode 4="L"

5-4. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-335 BOARD IC161)

Signal	Pin No.	I/O	I/O Level
$\overline{\text{ASURA RESET}}$	㊵	I	Normally "H", "L" when service interruption is detected or restored.
$\overline{\text{ASURA CS}}$	㊹	I	Chip select signal from timer microprocessor. V period "L" pulse.
S IN 0	㊺	I	Serial communication data from timer microprocessor. V period " L" pulse.
S OUT 0	㊻	O	Serial communication data to timer microprocessor. V period "L" pulse.
S CLK	㊼	I	Serial communication clock from timer microprocessor. V period "L" pulse.

5-5. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-335 BOARD IC161)

Signal	Pin No.	I/O	STOP/FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
AF ENV	㊾	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	㉛	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
AF REC $\overline{\text{P}}$	②	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	⑩	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
FULL ERS	㊱	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 30 Hz 50 % duty pulse approx. 5 msec delayed from RF SW P.

5-6. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-335 BOARD IC161)

Pin No.	Pin Name	I/O	Function
1	RF SWP	O	RF switching pulse output.
2	AF REC $\overline{P}$	O	"H" when HiFi audio REC.
3	N.C.	—	Not used.
4	QVD	O	Quasi VD pulse output.
5	AUTO PRESET	O	"H" during auto preset.
6	FE ON	O	Flying erase ON/OFF
7	REC CTL	O	REC CTL signal output.
8	CTL RESET	O	Capstan current control. "H" during slow mode.
9	CAM 2	I	Cam motor control.
10	N.C.	—	Not used.
11	TA MUTE	O	Tuner audio mute. H: Mute
12	$\overline{\text{S-VHS}}$	I	S-VHS tape detection signal in.
13	NT JUDGE	I	Not used.
14	MESECAM DET	I	Not used.
15	CIN (REC PRF)	I	Erasing protection tab, cassette in detection signal input.
16	AV CONT	O	Not used.
17	$\overline{\text{SECAM ON}}$	—	Not used.
18	SW1	—	Not used.
19	MODE 4	I	Cam encoder signal input.
20	MODE 3	I	Cam encoder signal input.
21	MODE 2	I	Cam encoder signal input.
22	MODE 1	I	Cam encoder signal input.
23	POWER SAVE CONT 1	O	Not used.
24	POWER SAVE C+	O	Not used.
25	MOD CONT	O	Not used.
26	$\overline{\text{TV}}$/VTR	O	$\overline{\text{TV}}$/VTR control signal output.
27	N.C.	—	Not used.
28	SDA 0	I/O	I^2C data.
29	N.C.	—	Not used.
30	SCL 0	I/O	I^2C clock.
31	A MUTE	O	"H" when audio mute.
32	T/E LED	O	Tape top/end sensors driver.
33	N.C.	—	Not used.
34	N.C.	—	Not used.
35	$\overline{\text{CAP STOP}}$	O	Capstan stop signal output.
36	FULL ERS	O	Full erase control.
37	N.C.	—	Not used.
38	N.C.	—	Not used.
39	MP	I	Fixed to "L".
40	$\overline{\text{ASURA RESET}}$	I	System reset signal.
41	VSS	—	Ground.
42	XTAL	O	System clock 16MHz.
43	EXTAL	I	System clock 16MHz.
44	$\overline{\text{ASURA CS}}$	I	Servo/system control microcomputer chip select signal.
45	S IN 0	I	Serial communication signal.
46	S OUT 0	O	Serial communication signal.
47	$\overline{\text{SCLK}}$	I	Serial communication signal.
48	NICOL ON	O	NICOL control signal out.
49	CBC POWER	O	Cable box control signal out.
50	F. MONO	O	Forced mono.

Pin No.	Pin Name	I/O	Function
51	SW2	O	Not used.
52	AVSS	—	Unswitched ground.
53	AVREF	—	AD port reference input UNSW 5V.
54	AVDD	—	UNSW 5V.
55	NTPB SW	I	Not used.
56	AV ADJ	I	Adjustment mode.
57	$\overline{\text{FOLLOW TV}}$	I	Not used.
58	N.C.	—	Not used.
59	AF ENV	I	HiFi audio playback signal envelope.
60	RF ENV	I	Video playback signal envelope.
61	T SENS	I	Take-up end sensor.
62	S SENS	I	Supply end sensor.
63	S REEL FG	I	Supply reel FG input.
64	T REEL FG	I	Take-up reel FG input.
65	N.C.	—	Not used.
66	VSYNC	I	Composite sync. signal input.
67	$\overline{\text{PB CTL}}$	I	Playback CTL input.
68	DRM PG	I	Drum PG input.
69	DRM FG	I	Drum FG input.
70	CAP FG	I	Capstan FG input.
71	BLUE BACK ON	O	Not used.
72	CAP RVS	O	Capstan reverse control "H" when reverse.
73	CAP DA	O	Capstan error D/A output.
74	DRM DA	O	Drum PG output.
75	N.C.	—	Not used.
76	N.C.	—	Not used.
77	REC COUNT	I	Counter signal input when recording.
78	C PLUS DET	O	Not used.
79	N.C.	—	Not used.
80	DATA (SSB)	O	Serial communication data.
81	CLOCK (SSB)	O	Serial communication clock.
82	N.C.	—	Not used.
83	N.C.	—	Not used.
84	CAP TRQ PWM	O	PWM output for capstan torque control.
85	N.C.	—	Not used.
86	N.C.	—	Not used.
87	N.C.	—	Not used.
88	VSS	—	Ground.
89	VDD	—	5V.
90	5V	—	5V.
91	N.C.	—	Not used.
92	CTL HYS HIGH	O	CTL amp gain control.
93	N.C.	—	Not used.
94	N.C.	—	Not used.
95	N.C.	—	Not used.
96	AF REC	O	"H" output when hifi audio recording.
97	N.C.	—	Not used.
98	N.C.	—	Not used.
99	STEP PLS	O	Step pulse "H" when capstan step driving.
100	AF SWP	O	AF switching pulse output.

5-7. TUNER/TIMER MODE CONTROL PIN FUNCTIONS (FR-139 BOARD IC460)

Pin No.	Pin Name	I/O	Function
1	N.C.	I	Not used.
2	$\overline{\text{POWER FAIL}}$	I	Power failure detect signal input.
3	H DET	I	H DET_(TUNER H SYNC detect input).
4	SIRCS IN	I	Remote control signal (SIRCS) input.
5	STEREO DET	I	Stereo judge input.
6	SW1 SIRCS OUT	O	Remote control signal (SIRCS) output.
7	BUZZER	O	Buzzer signal output.
8	MUTE	O	MUTE control.
9	RESET	O	Not used.
10	SCK 0	I	Serial communication signal (Serial clock).
11	SI 0	I	Serial communication signal (Data input).
12	SO 0	O	Serial communication signal (Data output).
13	EEP $\overline{\text{WC}}$	O	EEP mode control.
14	LANC IN	I	LANC input.
15	LANC OUT	O	LANC output.
16	A/D 0	I	Analog voltage (KEY) input.
17	A/D 1	I	Analog voltage (KEY) input.
18	A/D 2	I	Analog voltage (KEY) Input.
19	A/D 3	I	Analog voltage (KEY) Input.
20	A/D 4	I	Analog voltage (KEY) Input.
21	ML LED	O	ML LED ON/OFF control.
22	X $\overline{\text{CS}}$	O	NL-2 board IC003 chip select signal out.
23	AFT	I	AFT (Auto fine tuning signal input).
24	AVDD	I	A/D port reference input.
25	AV REF		UNSW 5V.
26	SCL 0	O	T BUS (clock) /IIC BUS (clock).
27	CG CS	O	Character generator chip select signal.
28	SDA 0	O	IIC BUS (data).
29	JOG LED	O	JOG LED control signal output.
30	AVSS	I	UNSW ground.
31	EXTAL		System clock terminal (16MHz).
32	XTAL		System clock terminal (16MHz).
33	VSS		Ground.
34	$\overline{\text{RST}}$	I	RESET input.
35	PLL CLK	O	TUNER PLL clock.
36	PLL DATA	O	TUNER PLL data.
37	PLL ENABLE	O	TUNER chip select.
38	MAIN/$\overline{\text{SAP}}$	O	NO USE (MAIN/SAP judge signal output).
39	$\overline{\text{SAP}}$ DET	O	MAIN/SAP judge input.
40	$\overline{\text{V SET CS}}$	O	V SET IC chip select signal.
41	DMS 1	I	DMS forward/reverse signal input.
42	DMS 2	I	DMS forward/reverse signal input.
43	VFDP	I	VFDP.
44	SEG1	O	Segment terminal 1
45	SEG2	O	Segment terminal 2
46	SEG3	O	Segment terminal 3
47	SEG4	O	Segment terminal 4
48	SEG5	O	Segment terminal 5
49	SEG6	O	Segment terminal 6

Pin No.	Pin Name	I/O	Function
50	SEG7	O	Segment terminal 7
51	SEG8	O	Segment terminal 8.
52	SEG9	O	Segment terminal 9.
53	SEG10	O	Segment terminal 10.
54	SEG11	O	Segment terminal 11.
55	SEG12	O	Segment terminal 12.
56	SEG13	O	Segment terminal 13.
57	SEG14	O	Segment terminal 14.
58	SEG15	O	Segment terminal 15.
59	SEG16	O	Segment terminal 16.
60	NC		Non Connect.
61	NC		Non Connect.
62	GRID10	O	Grid terminal 10.
63	GRID9	O	Grid terminal 9.
64	GRID8	O	Grid terminal 8.
65	GRID7	O	Grid terminal 7.
66	GRID6	O	Grid terminal 6.
67	GRID5	O	Grid terminal 5.
68	GRID4	O	Grid terminal 4.
69	GRID3	O	Grid terminal 3.
70	GRID2	O	Grid terminal 2.
71	GRID1	O	Grid terminal 1.
72	VDD		D5V
73	TX		Timer clock terminal (32.768kHz).
74	TEX		Timer clock terminal (32.768kHz).
75	NC/VPP	O	D5V
76	ASURA $\overline{\text{CS}}$	O	S/S microcomputer chip select signal.
77	$\overline{\text{SYS RESET}}$	O	System reset output.
78	POWER CONT 1	O	Power supply control signal.
79	POWER CONT 2	O	Power supply control signal.
80	CG V	I	Composite sync input.

SECTION 6
ADJUSTMENTS

6-1 MECHANICAL ADJUSTMENTS

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL Ⅵ (S MECHANISM)" (9-921-647-11).

6-2. ELECTRICAL ADJUSTMENTS

See the adjusting parts location diagram from on page 6-8 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth of 30MHz or more, with delay mode (A probe 10:1 should be used unless otherwise specified.)
3) Frequency counter
4) Pattern generator
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Alignment tapes
    KRV-51N2 Part No.: 8-192-605-32

2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

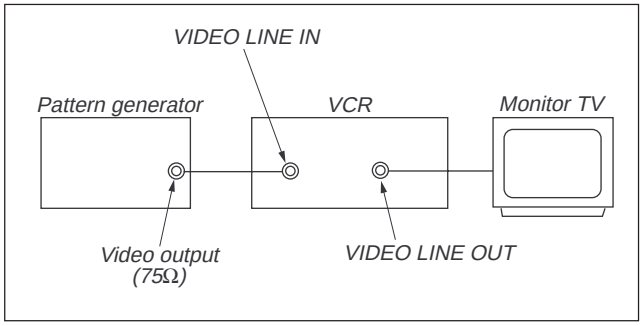


Fig. 6-2-1.

2-1-3. Input Signal Check

Video signal produced by a pattern generator is used as an adjustment signal to perform electrical alignment for this unit. This video signal must satisfy the specification.

Unless otherwise specified, place the switches and controls of this unit in the following positions:

• INPUT SELECT switch ..... LINE or LINE 1 (Remote commander)

Connect an oscilloscope to the Video Input terminal. Check that the synchronizing signal of the Y signal has an amplitude of approximately 0.7V and that the burst signal has an amplitude of approximately 0.3V and its waveform is flat. And check that the level ratio of burst signal to "red" signal is 0.30 : 0.66. The video signal (color bar) used for electrical aligning this unit is shown in Fig. 6-2-2.

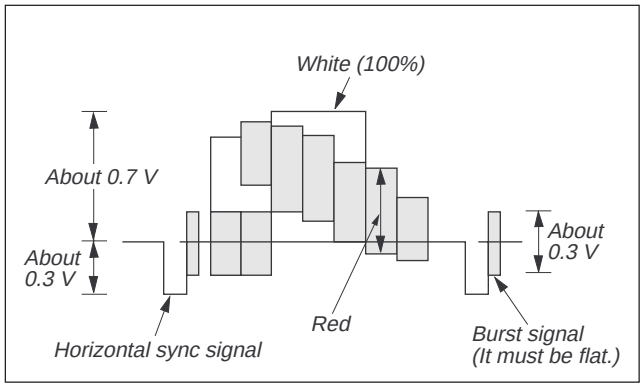


Fig. 6-2-2. Color Bar Signals of Pattern Generator

2-1-4. Alignment Tape

• Contents of KRV-51N2

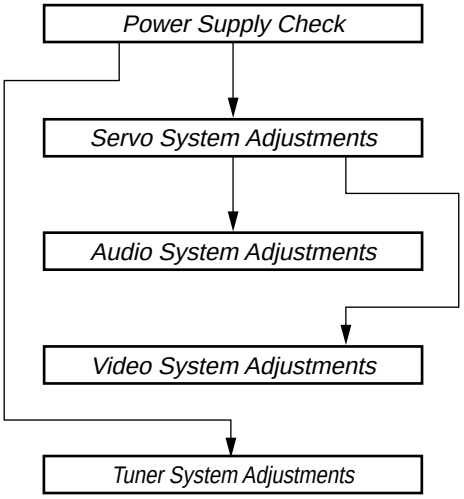
	Mode	Period	Video signal	Audio signal	
				Hi-Fi	Normal
1	SP	7 minutes	Color bar	400Hz	400Hz
2		3 minutes	Monoscope		
3	EP	7 minutes	Color bar		
4		3 minutes	Monoscope		

2-1-5. Input/Output Levels and Impedance

Video input: LINE IN
Input signal: 1Vp-p, 75ohms, unbalanced, sync negative
Video output: LINE OUT
Output signal: 1Vp-p, 75ohms, unbalanced, sync negative
Audio input: LINE IN
Input level: –7.5 dBs
(0dBs= 0.775Vrms)
Input impedance: more than 47 kilohms
Audio output: LINE OUT
Standard level: –7.5dBs at load impedance 47 kilohms
Output impedance: less than 10 kilohms

2-1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



2-2. POWER SUPPLY CHECK

2-2-1. Output Voltage Check (MA-335 Board)

Mode	E-E
Measuring Instrument	Digital voltmeter
SW 12V Check	
Measurement point	IC601 pin ②
Specified value	12.0 ± 0.3V
MTR12V Check	
Measurement point	Q605 Ⓒ
Specified value	13.2 ± 1.0V
SW5V Check	
Measurement point	Q603 Ⓔ
Specified value	5.1 ± 0.3V

[Check Method]

1) Each of these supply voltages must meet its specified value.

2-3. SERVO SYSTEM CHECK

Unless otherwise specified, set the switches to the following positions.

- INPUT SELECT switch ..... LINE 1
- TAPE SPEED switch ..... SP (Remote commander)

2-3-1. RF Switching Position/ AF Switching Position Adjustments (MA-335 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: Video LINE OUT (RF switching position) CN341 pin ① (HF ADJ) (AF switching position) CH2: CN261 pin ③ (RF SWP)
Measuring instrument	Oscilloscope
Specified value	6.5 ± 0.5H (410 ± 32 µsec)

[Adjustment Method]

1) Short-circuit between JS161 and ground for about 1 second to activate the RF switching position adjustment mode.
2) Check that "AP" is indicated on FL display.
3) Using the channel + and – buttons, adjust to 410 ± 32 µsec (6.5 ± 0.5H).
4) Press the PAUSE button. (Adjustment is over for mono models.)
5) The set goes to the AF switching position adjustment mode.
6) Check that "AH" is indicated on FL display.
7) Using the channel + and – buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
8) Press the PAUSE button.
9) Check that "AH" indication is disappeared. When it is not disappeared, repeat from the item 1).
10) Press the STOP button.
11) Press the EJECT button.

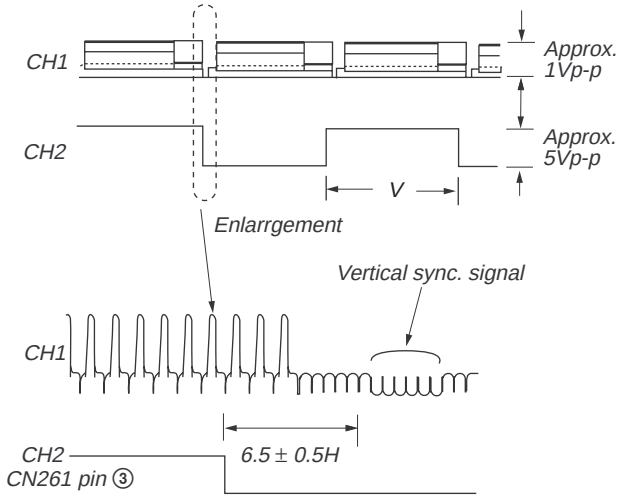


Fig. 6-2-3.

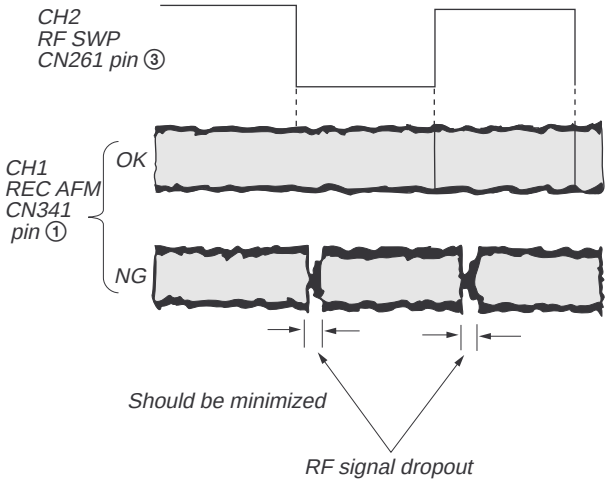


Fig. 6-2-4.

2-4. VIDEO SYSTEM CHECKS

For the video system checks, follow the checking procedures given below as a rule. The color bar video signal supplied from the pattern generator is used as the video input signal for the video system adjustment of the recording mode. Check that the signal satisfies the specified value designated in the "Check of input signal" (Fig. 6-2-2)

Unless otherwise specified, set the switches to the following positions.

- INPUT SELECT switch ..... LINE 1
- TAPE SPEED switch ..... SP (Remote commander)

[Checking Sequence]

1) X'tal OSC Check
2) SYNC AGC Check
3) Recording Y Level Check
4) Recording Chroma Level Check
5) Playback Level Check

2-4-1. X'tal OSC Check (MA-335 Board)

Mode	Playback
Signal	Alignment tape: SP Color bar portion
Measurement point	IC201 pin ㊺
Measuring instrument	Oscilloscope and Frequency counter
Specified value	3,579,545 ± 70Hz

Note: A frequency counter should be connected through a buffer amplifier (oscilloscope, etc.) having a high impedance and a low capacitance.

[Check Method]

1) Check that the oscillation frequency satisfies the specified value and that the oscillation voltage is 500 ± 200mVp-p.

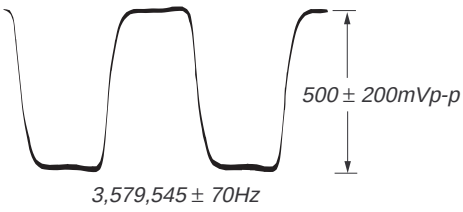


Fig. 6-2-5.

2-4-2. SYNC AGC Check (MA-335 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC201 pin ㊳
Measuring instrument	Oscilloscope
Specified value	A=2.10 ± 0.10Vp-p

[Check Method]

1) Check that the Video signal level (A) satisfies the specified value.

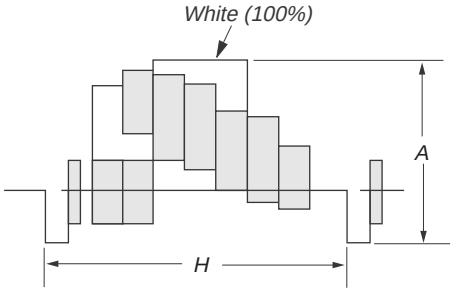


Fig. 6-2-6.

2-4-3. Recording Y Level Check (MA-335 Board)

Mode	E-E (SP)
Signal	No-signal
Measurement point	IC201 pin ⑱
Measuring instrument	Oscilloscope
Specified value	A=290 ± 70mVp-p

[Check Method]

1) Check that the recording RF signal satisfies the specified value.

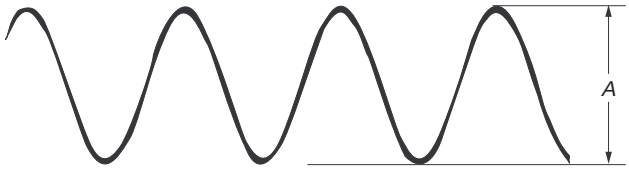


Fig. 6-2-8.

2-4-4. Recording Chroma Level Check (MA-335 Board)

Mode	Recording (SP)
Signal	Color bar
Measurement point	IC201 pin ⑭
Measuring instrument	Oscilloscope
Specified value	A=450 ± 70mVp-p

[Check Method]

1) Confirm the amplitude of recording chroma level becomes the specified value.

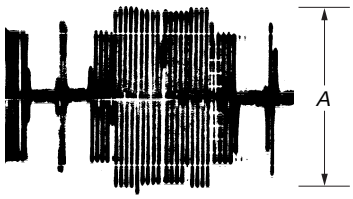


Fig. 6-2-9.

2-4-5. Playback Level Check (MA-335 Board)

Mode	Playback
Signal Alignment	Alignment tape : SP mode color bar portion
Measurement point	Video LINE OUT terminal
Measuring instrument	Oscilloscope
Specified value	A=1.0 ± 0.1Vp-p (75Ω terminated)

[Check Method]

1) Check that the playback level satisfies the specified value.

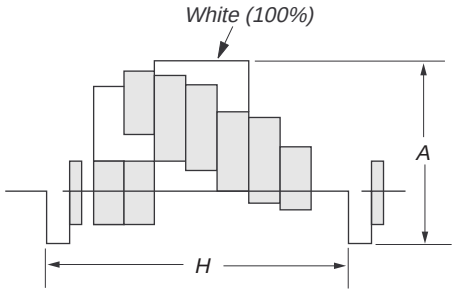


Fig. 6-2-10.

2-5. AUDIO SYSTEM ADJUSTMENT

- For the adjustment of the audio system, perform in the SP mode if there is no special notes. Use the alignment tape.

[Connecting Instruments]

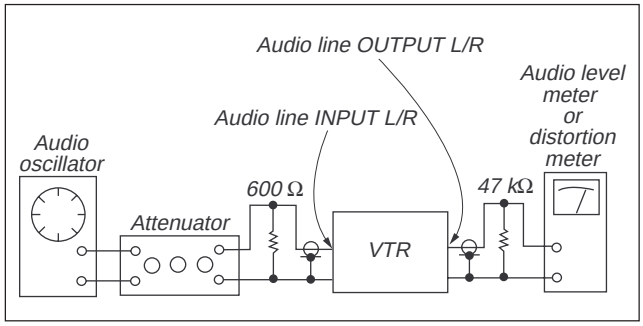


Fig. 6-2-11.

- Adjust in the SP mode if there is no special indications.
- Perform the adjustment setting the switch on the following positions.
- INPUT SELECT switch ..... LINE 1

[Adjustment Method]

1. ACE head adjustment.....Refer to the VHS mechanical adjustment manual Ⅵ (S MECHANISM)(9-921-647-11).
2. E-E output level check
3. Overall Output level and distortion factor check
4. Overall noise level check.

2-5-1. ACE Head Adjustment

Refer to the VHS mechanical adjustment manual Ⅵ (S MECHANISM)(9-921-647-11).

2-5-2. E-E Output Level Check

Mode	E-E
Signal	400Hz, –7.5dBs : CJ570
Measurement point	CJ570
Measuring instrument	Audio level meter
Specified value	–7.5 ± 2dBs

[Check Method]

1) Input signal of 400Hz and –7.5dBs to the CJ461 L/R.
2) Check that the audio output level is –7.5 ± 3dBs.

2-5-3. Overall Output Level and Distortion Factor Check

Mode	Self-record playback
Signal	400Hz, –7.5dBs : CJ570
Measurement point	CJ570
Measuring instrument	Audio level meter and Distortion meter
Specified value	Playback Level: –7.5 ± 3dBs Distortion: 4.0% or less

[Check Method]

1) Input signal of 400Hz and –7.5dBs to the audio input.
2) Record signal.
3) Playback the recorded portion.
4) Check that the output level is –7.5 ± 3dBs.
5) Check that the distortion factor is 4.0% or less.

2-5-4. Overall Noise Level Check

Mode	Self-record playback
Signal	No signal (Insert a shorting plug into the Audio LINE IN terminal)
Measurement point	CJ570
Measuring instrument	Audio level meter
Specified value	– 45.5dBs or less

[Check Method]

1) Record.
2) Playback recorded portion.
3) Check that noise level is – 45.5dBs or less.

2-6. TUNER SYSTEM ADJUSTMENT

2-6-1. Separation Adjustment (MA-335 Board)

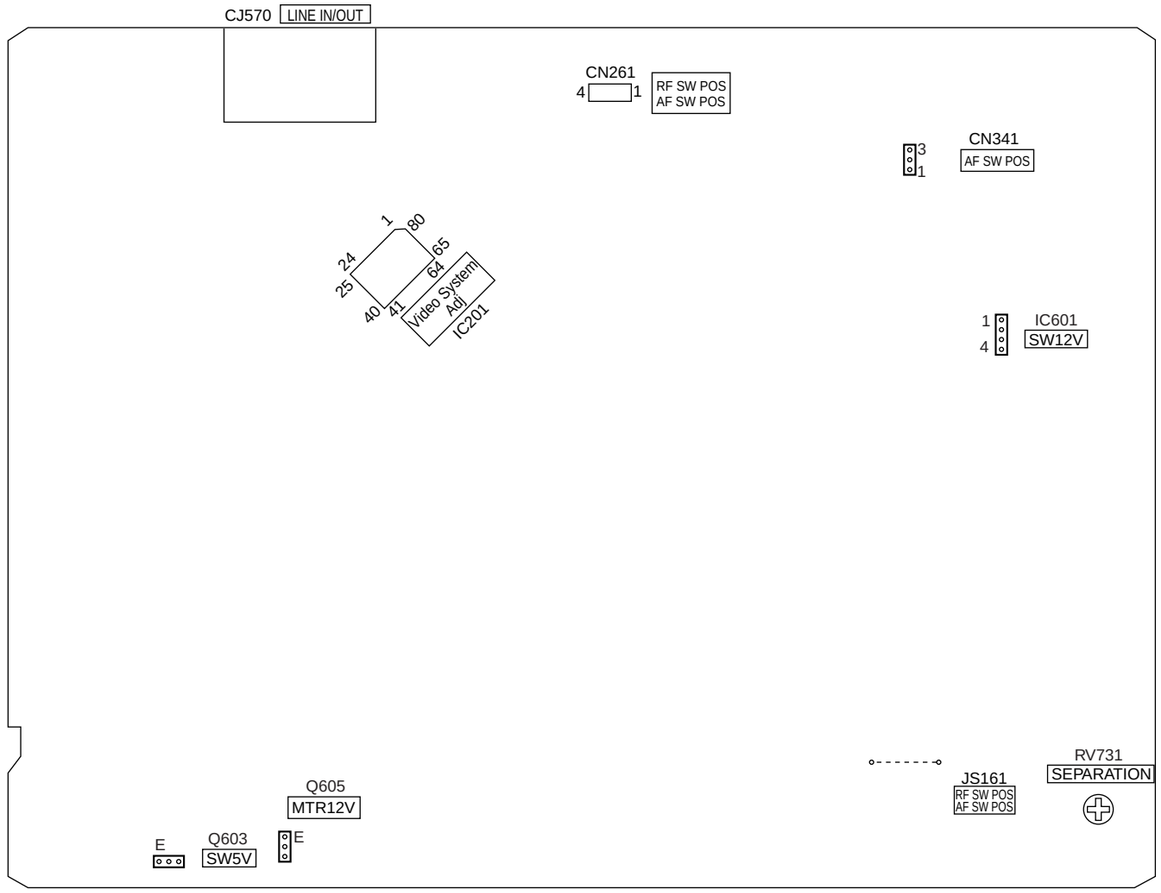
Mode	E-E
Signal	RF signal Video : Color bar white (100%) modulation Audio : L: 400Hz, R: 2kHz 30% modulation Electrical field: 60-80dBm/75Ω terminated
Measuring instrument	Audio level meter
Measuring point	LINE OUT L
Adjusting element	RV731
Specified value	2kHz component minimum

[Adjustment Method]

1) Connect an audio level meter to LINE OUT L channel via HPF.
2) Feed the RF signal from RF IN terminal.
3) Adjust with RV731 so that the output level satisfies the specified value.

2-7. ADJUSTING PARTS LOCATION DIAGRAM

MA-335 BOARD (CONDUCTOR SIDE)



SECTION 7
REPAIR PARTS LIST

7-1. EXPLODED VIEWS

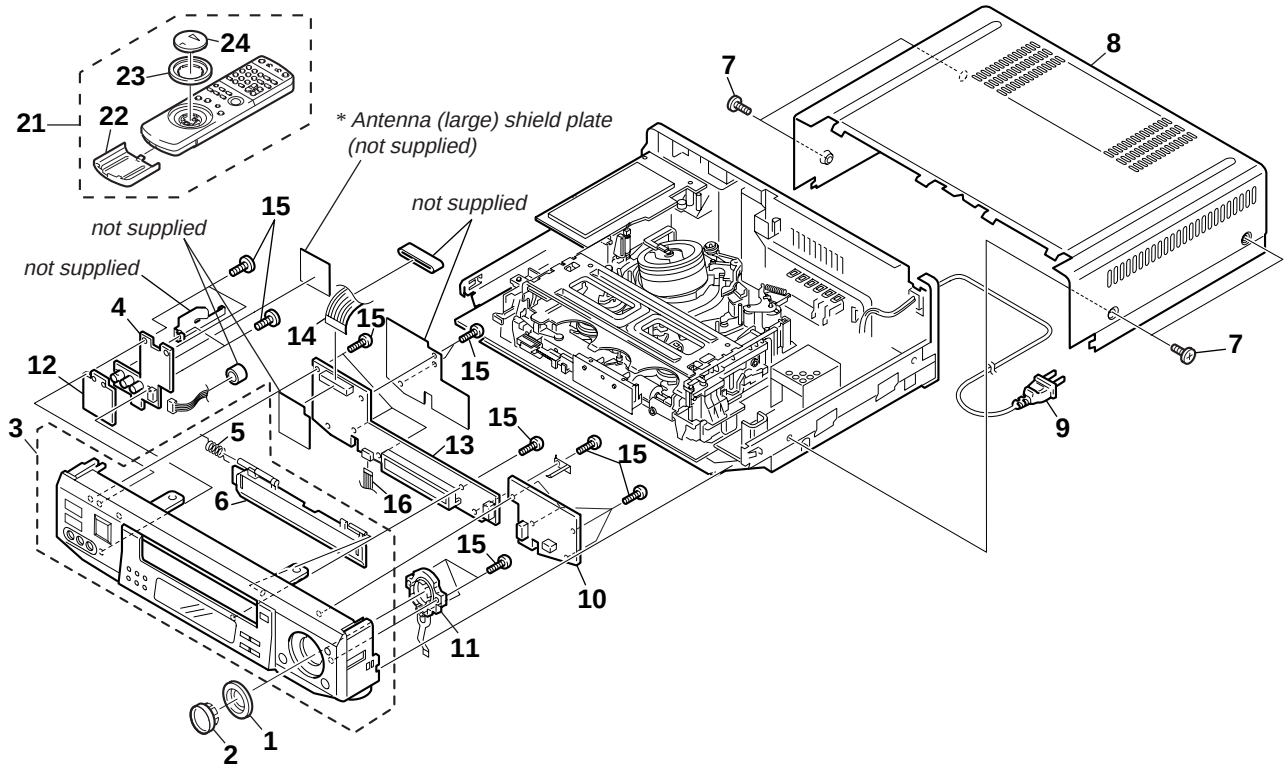
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

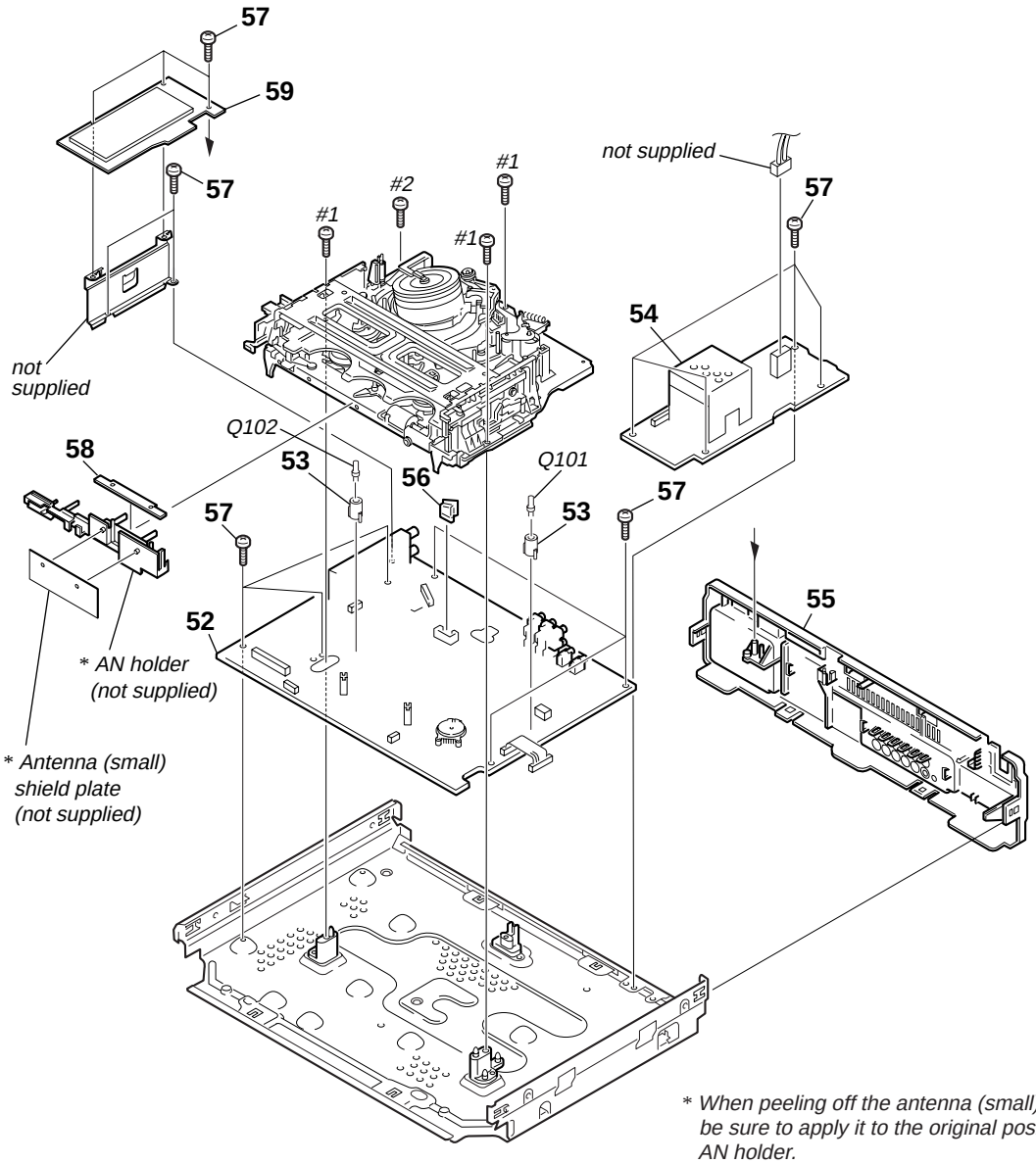
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

7-1-1. FRONT PANEL ASSEMBLY AND UPPER CASE SECTION



Ref. No.	Part No.	Description	Remarks
1	3-979-310-01	RING (AV), JOG	
2	3-979-309-01	BUTTON (AV), CENTER	
3	X-3948-111-1	PANEL ASSY,FRONT	
* 4	A-6791-566-A	AJ-2A BOARD, COMPLETE	
5	3-953-432-01	SPRING (GE), FL	
6	3-987-850-21	DOOR (I), CASSETTE	
7	3-710-901-11	SCREW, TAPPING	
8	3-979-313-41	CASE, UPPER	
⚠9	1-783-605-11	CORD, POWER	
* 10	A-6791-567-A	DM-81A BOARD, COMPLETE	
11	1-762-844-21	SWITCH, ROTARY	
* 12	A-6791-569-A	AN-17A BOARD, COMPLETE	
* 13	A-6791-606-A	FR-139B BOARD, COMPLETE	
14	1-783-515-11	CABLE, FLAT (FFM-23)	
15	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
16	1-783-547-11	CABLE, FLAT (FFM-25)	
21	1-475-749-21	COMMANDER, STANDARD (RMT-V250)	
22	3-709-044-01	COVER, BATTERY	
23	3-973-077-31	RING, CHANGE SPEED	
24	3-972-850-01	BUTTON, FUNCTION	

7-1-2. CHASSIS SECTION

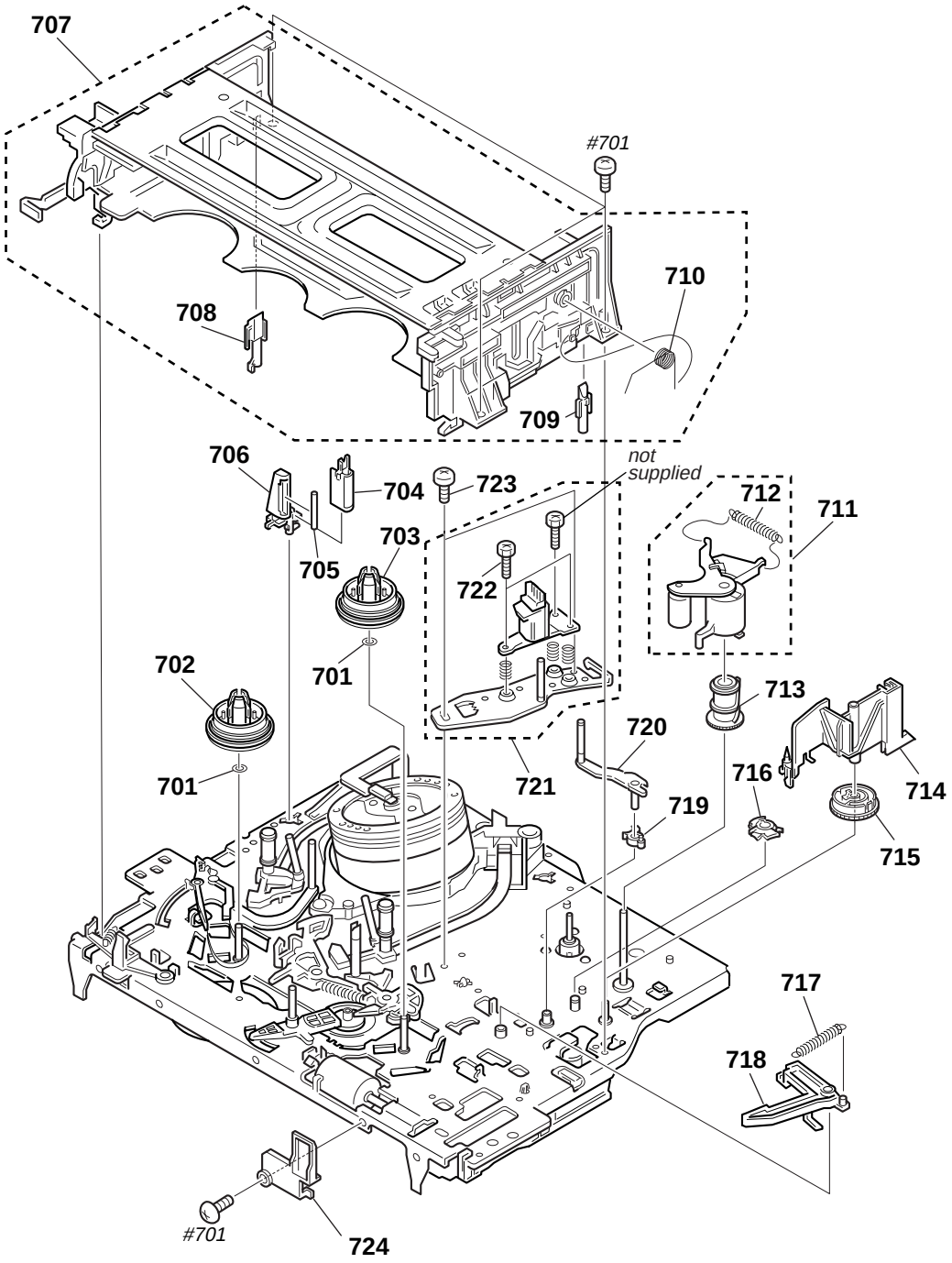


** When peeling off the antenna (small) shield plate, be sure to apply it to the original position on the AN holder.*
If not so, the resonance level of AN-16 board becomes small.

Ref. No.	Part No.	Description	Remarks
* 52	A-6791-607-A	MA-335B BOARD, COMPLETE	
53	3-682-057-11	SPACER (SMALL)	
⚠54	1-468-308-11	POWER BLOCK	
* 55	3-979-564-31	PANEL, REAR	
56	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P	
57	3-970-608-21	SUMITITE (B3), +BV	
* 58	A-6791-571-A	AN-16A BOARD, COMPLETE	
* 59	A-6791-609-A	MG-21 BOARD, COMPLETE	

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

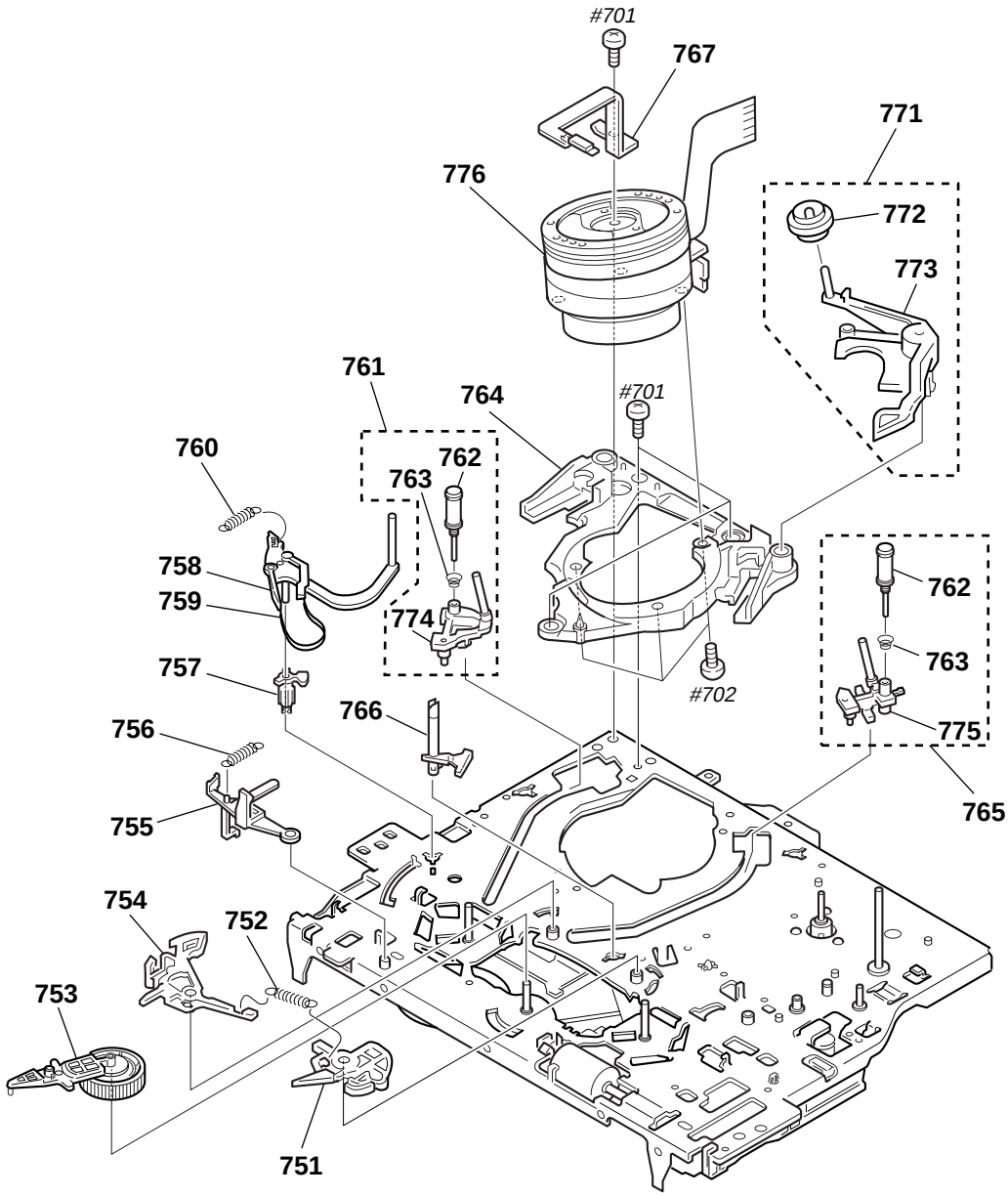
7-1-3. MECHANISM DECK-1



Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S) (GRAY)	
703	3-977-508-01	TABLE, REEL (T) (BLACK)	
704	1-500-144-11	HEAD, FE	
705	3-977-495-01	SHAFT TG2	
706	3-977-494-01	HOLDER, FEH	
707	A-6759-619-C	FL COMPLETE ASSY	
708	3-977-535-01	PLATE, LUMINOUS(END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS(TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	

Ref. No.	Part No.	Description	Remarks
713	3-977-447-01	GEAR, ELEVATOR	
714	3-977-514-01	OPENER, LID	
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING,EXTENSION(RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
723	3-979-508-01	SCREW	
724	3-978-485-01	PLATE, GUIDE CASSETTE	

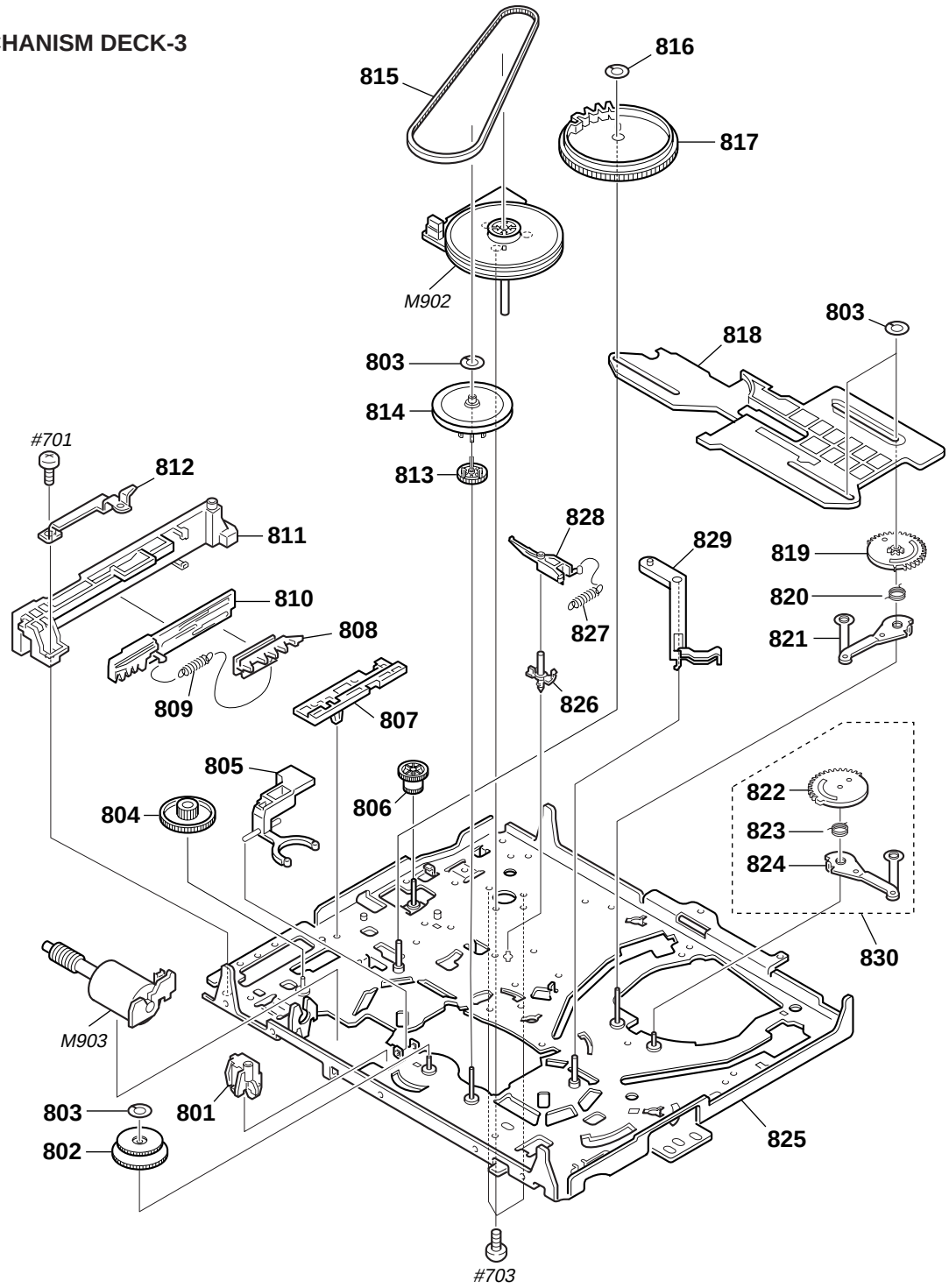
7-1-4. MECHANISM DECK-2



Ref. No.	Part No.	Description	Remarks
751	X-3947-581-1	BRAKE ASSY,MAIN(T)	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-2	BRAKE ASSY, MAIN(S)	
755	3-977-513-02	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	

Ref. No.	Part No.	Description	Remarks
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	
765	A-6750-325-A	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT	
771	A-6746-074-G	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-975-724-07	ARM, HC	
774	X-3946-855-1	SHUTTLE (S) ASSY	
775	X-3946-856-1	SHUTTLE (T) ASSY	
776	8-839-044-02	DRUM ASSY DZH-94A/Z-RP (M901)	

7-1-5. MECHANISM DECK-3



Ref. No.	Part No.	Description	Remarks
801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	

Ref. No.	Part No.	Description	Remarks
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING(T)	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING(T)	
822	3-977-451-01	GEAR, LOADING(S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING(S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
830	A-6759-616-A	GEAR BLOCK ASSY, LOADING	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	

7-2. ELECTRICAL PARTS LIST

NOTE:

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

Ref. No.	Part No.	Description			Remarks
*	A-6791-566-A	AJ-2A BOARD, COMPLETE			
		**********			
		(Ref.No.:3,000 Series)			
		< CAPACITOR >			
C806	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
		< JACK >			
CJ801	1-774-509-11	JACK, PIN 3P (LINE-2 IN)			
		< CONNECTOR >			
CN801	1-506-484-11	PIN, CONNECTOR 5P			
		< DIODE >			
D801	8-719-421-59	DIODE MA3130WA-TX			
D802	8-719-421-59	DIODE MA3130WA-TX			
D803	8-719-422-37	DIODE MA8051			
D804	8-719-421-59	DIODE MA3130WA-TX			
		< RESISTOR >			
R801	1-216-295-00	METAL CHIP	0	5%	1/10W
R802	1-216-295-00	METAL CHIP	0	5%	1/10W
R803	1-216-022-00	METAL CHIP	75	5%	1/10W
*	A-6791-571-A	AN-16A BOARD, COMPLETE			
		**********			
		(Ref.No.:3,000 Series)			
		< CAPACITOR >			
C201	1-163-136-00	CERAMIC CHIP	620PF	1%	50V
		< CONNECTOR >			
CN201	1-506-468-11	PIN, CONNECTOR 3P			
		< RESISTOR >			
R201	1-216-295-00	METAL CHIP	0	5%	1/10W
R202	1-216-295-00	METAL CHIP	0	5%	1/10W
*	A-6791-569-A	AN-17A BOARD, COMPLETE			
		**********			
		(Ref.No.:3,000 Series)			
		< CAPACITOR >			
C101	1-125-830-91	CERAMIC CHIP	680PF	1%	50V
C102	1-163-243-11	CERAMIC CHIP	47PF	5%	50V

Ref. No.	Part No.	Description			Remarks
		< CONNECTOR >			
CN101	1-506-482-11	PIN, CONNECTOR 3P			
*	A-6791-567-A	DM-81A BOARD, COMPLETE			
		**********			
		(Ref.No.:2,000 Series)			
		< CONNECTOR >			
CN440	1-770-031-11	CONNECTOR, BOARD TO BOARD 7P			
CN441	1-770-514-41	CONNECTOR, FFC/FPC 5P			
		< DIODE >			
D440	8-719-056-06	DIODE SLR-342DC3F			
		< TRANSISTOR >			
Q440	8-729-424-08	TRANSISTOR UN2111			
		< RESISTOR >			
R441	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R442	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R443	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R444	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R445	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R446	1-216-029-00	METAL CHIP	150	5%	1/10W
		< SWITCH >			
S441	1-762-196-21	SWITCH, TACT (EJECT)			
S442	1-762-196-21	SWITCH, TACT (REC)			
S443	1-762-196-21	SWITCH, TACT (JOG)			
S444	1-762-196-21	SWITCH, TACT (PAUSE)			
*	A-6791-606-A	FR-139B BOARD, COMPLETE			
		**********			
		(Ref.No.:2,000 Series)			
		< BUZZER >			
BZ460	1-529-104-11	BUZZER, PIEZOELECTRIC			
		< CAPACITOR >			
C460	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C461	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C462	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C463	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C464	1-164-232-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remarks
C465	1-126-916-11	ELECT	1000uF	20%	6.3V
C466	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C467	1-126-935-11	ELECT	470uF	20%	6.3V
C468	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C469	1-104-905-11	CAPACITOR	0.22F		5.5V
C471	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C472	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C473	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C474	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C475	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C476	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C477	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C478	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C479	1-126-096-11	ELECT	10uF	20%	35V
		< CONNECTOR >			
CN460	1-695-392-31	PIN, CONNECTOR (PC BOARD) 31P			
* CN461	1-691-406-11	CONNECTOR, BOARD TO BOARD 7P			
CN464	1-568-852-11	PIN, CONNECTOR (PC BOARD) 9P			
		< DIODE >			
D420	8-719-110-03	DIODE RD7.5ESB2			
D460	8-719-056-07	DIODE SLR-342MC3F			
D462	8-719-200-82	DIODE 11ES2			
D463	8-719-200-82	DIODE 11ES2			
D464	8-719-056-06	DIODE SLR-342DC3F			
		< IC >			
IC460	8-752-891-12	IC CXP82960-055Q			
IC462	8-759-518-23	IC X24C04S8			
IC463	8-759-248-87	IC MM1256XF-BE			
IC464	8-742-012-11	HY B IC SBX1976-51			
		< JUMPER RESISTOR >			
JR401	1-216-296-00	METAL CHIP	0	5%	1/8W
JR402	1-216-295-00	METAL CHIP	0	5%	1/10W
JR404	1-216-295-00	METAL CHIP	0	5%	1/10W
JR405	1-216-296-00	METAL CHIP	0	5%	1/8W
JR406	1-216-295-00	METAL CHIP	0	5%	1/10W
JR407	1-216-295-00	METAL CHIP	0	5%	1/10W
JR408	1-216-296-00	METAL CHIP	0	5%	1/8W
JR409	1-216-296-00	METAL CHIP	0	5%	1/8W
JR410	1-216-296-00	METAL CHIP	0	5%	1/8W
JR411	1-216-296-00	METAL CHIP	0	5%	1/8W
JR412	1-216-296-00	METAL CHIP	0	5%	1/8W
JR413	1-216-296-00	METAL CHIP	0	5%	1/8W
JR414	1-216-295-00	METAL CHIP	0	5%	1/10W
JR415	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L181	1-410-509-11	INDUCTOR	10uH		
		< FLUORECENT INDICATOR >			
ND420	1-517-733-11	TUBE, FLUORESCENT INDICATION			
		< TRANSISTOR >			
Q460	8-729-421-22	TRANSISTOR UN2211			
Q461	8-729-421-22	TRANSISTOR UN2211			

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R404	1-216-089-00	METAL CHIP	47K	5%	1/10W
R405	1-216-075-00	METAL CHIP	12K	5%	1/10W
R406	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R407	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R408	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R409	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R410	1-216-075-00	METAL CHIP	12K	5%	1/10W
R411	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R412	1-216-073-00	METAL CHIP	10K	5%	1/10W
R413	1-216-073-00	METAL CHIP	10K	5%	1/10W
R415	1-216-073-00	METAL CHIP	10K	5%	1/10W
R416	1-216-073-00	METAL CHIP	10K	5%	1/10W
R417	1-216-073-00	METAL CHIP	10K	5%	1/10W
R420	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R460	1-216-029-00	METAL CHIP	150	5%	1/10W
R461	1-216-089-00	METAL CHIP	47K	5%	1/10W
R462	1-216-049-00	METAL CHIP	1K	5%	1/10W
R463	1-216-089-00	METAL CHIP	47K	5%	1/10W
R464	1-414-235-11	INDUCTOR CHIP	0UH		
R465	1-414-235-11	INDUCTOR CHIP	0UH		
R466	1-216-073-00	METAL CHIP	10K	5%	1/10W
R467	1-216-073-00	METAL CHIP	10K	5%	1/10W
R468	1-216-113-00	METAL CHIP	470K	5%	1/10W
R469	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R470	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R471	1-216-025-91	RES,CHIP	100	5%	1/10W
R472	1-216-025-91	RES,CHIP	100	5%	1/10W
R474	1-216-113-00	METAL CHIP	470K	5%	1/10W
R475	1-216-295-00	METAL CHIP	0	5%	1/10W
R476	1-216-295-00	METAL CHIP	0	5%	1/10W
R477	1-216-095-00	METAL CHIP	82K	5%	1/10W
R478	1-216-113-00	METAL CHIP	470K	5%	1/10W
R479	1-216-049-00	METAL CHIP	1K	5%	1/10W
R480	1-216-049-00	METAL CHIP	1K	5%	1/10W
R481	1-216-049-00	METAL CHIP	1K	5%	1/10W
R482	1-216-049-00	METAL CHIP	1K	5%	1/10W
R483	1-216-073-00	METAL CHIP	10K	5%	1/10W
R484	1-216-073-00	METAL CHIP	10K	5%	1/10W
R485	1-216-113-00	METAL CHIP	470K	5%	1/10W
R486	1-216-081-00	METAL CHIP	22K	5%	1/10W
R487	1-216-029-00	METAL CHIP	150	5%	1/10W
R488	1-216-025-91	RES,CHIP	100	5%	1/10W
R490	1-216-025-91	RES,CHIP	100	5%	1/10W
R492	1-414-235-11	INDUCTOR CHIP	0UH		
R493	1-414-235-11	INDUCTOR CHIP	0UH		
		< SWITCH >			
S402	1-762-196-21	SWITCH, TACT (POWER)			
S403	1-762-196-21	SWITCH, TACT (COMMAND MODE VTR1/2/3)			
S404	1-762-196-21	SWITCH, TACT (SMARTFILE)			
S405	1-762-196-21	SWITCH, TACT (EASY SET UP)			
S406	1-762-196-21	SWITCH, TACT (CURSOR)			
S407	1-762-196-21	SWITCH, TACT (OK)			
S408	1-762-196-21	SWITCH, TACT (INPUT SELECT)			
S409	1-762-196-21	SWITCH, TACT (CHANNEL:-)			
S410	1-762-196-21	SWITCH, TACT (CHANNEL:+)			
S411	1-762-196-21	SWITCH, TACT (REW)			
S412	1-762-196-21	SWITCH, TACT (FF)			

Ref. No.	Part No.	Description			Remarks
		< VIBRATOR >			
X460	1-760-494-11	VIBRATOR, CRYSTAL 16MHz			
X461	1-579-463-11	VIBRATOR, CRYSTAL 32.768kHz			
*	A-6791-607-A	MA-335B BOARD, COMPLETE			
		**********			
					(Ref.No.:1,000 Series)
*	3-960-273-01	SPACER, TOP END			
*	3-960-274-01	SPACER, LED			
		< CAPACITOR >			
C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C103	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C105	1-128-057-11	ELECT	330uF	20%	6.3V
C106	1-124-589-11	ELECT	47uF	20%	16V
C108	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C109	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C118	1-137-441-11	FILM	0.027uF	5%	50V
C119	1-126-157-11	ELECT	10uF	20%	16V
C120	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C121	1-124-463-00	ELECT	0.1uF	20%	50V
C122	1-126-154-11	ELECT	47uF	20%	6.3V
C123	1-130-489-00	MYLAR	0.033uF	5%	50V
C140	1-126-933-11	ELECT	100uF	20%	16V
C142	1-126-933-11	ELECT	100uF	20%	16V
C143	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C144	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V
C145	1-104-664-11	ELECT	47uF	20%	16V
C146	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C147	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C149	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C150	1-104-664-11	ELECT	47uF	20%	16V
C151	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C152	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C153	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C160	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C161	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C162	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C163	1-126-154-11	ELECT	47uF	20%	6.3V
C164	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C165	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C166	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C172	1-124-584-00	ELECT	100uF	20%	10V
C201	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C202	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C204	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C205	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C206	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C207	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C208	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C209	1-124-248-00	ELECT	22uF	20%	35V
C210	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C214	1-163-124-00	CERAMIC CHIP	200PF	5%	50V
C217	1-109-982-11	CERAMIC CHIP	1uF	10%	10V

Ref. No.	Part No.	Description			Remarks
C219	1-164-159-21	CERAMIC	0.1uF		50V
C220	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C222	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C223	1-124-589-11	ELECT	47uF	20%	16V
C226	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C228	1-124-261-00	ELECT	10uF	20%	50V
C229	1-164-159-21	CERAMIC	0.1uF		50V
C230	1-124-589-11	ELECT	47uF	20%	16V
C231	1-124-261-00	ELECT	10uF	20%	50V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C233	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C234	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C235	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C236	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C237	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C238	1-164-159-21	CERAMIC	0.1uF		50V
C240	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C241	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C242	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C243	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C245	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C246	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C247	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C248	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C250	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C251	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C252	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C253	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C254	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C255	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C256	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C257	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C260	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C261	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C264	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C265	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C266	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C267	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C268	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C269	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C270	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C271	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C272	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C273	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C274	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C276	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C277	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C278	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C279	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C280	1-124-584-00	ELECT	100uF	20%	10V
C281	1-164-346-11	CERAMIC CHIP	1uF		16V
C282	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C283	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C284	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C285	1-162-306-11	CERAMIC	0.01uF	20%	16V
C286	1-124-584-00	ELECT	100uF	20%	10V
C287	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C288	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C289	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C301	1-164-159-21	CERAMIC	0.1uF		50V

Ref. No.	Part No.	Description			Remarks
C305	1-126-160-11	ELECT	1uF	20%	50V
C306	1-126-160-11	ELECT	1uF	20%	50V
C307	1-126-964-11	ELECT	10uF	20%	50V
C308	1-104-664-11	ELECT	47uF	20%	16V
C309	1-126-963-11	ELECT	4.7uF	20%	50V
C310	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C311	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C312	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C313	1-124-261-00	ELECT	10uF	20%	50V
C314	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C315	1-126-160-11	ELECT	1uF	20%	50V
C317	1-126-163-11	ELECT	4.7uF	20%	50V
C318	1-104-664-11	ELECT	47uF	20%	16V
C331	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C332	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C333	1-124-589-11	ELECT	47uF	20%	16V
C334	1-137-374-11	FILM	0.047uF	5%	50V
C340	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C341	1-124-589-11	ELECT	47uF	20%	16V
C342	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C346	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C350	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C352	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C353	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C357	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C358	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C359	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C361	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C362	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C363	1-126-960-11	ELECT	1uF	20%	50V
C364	1-126-960-11	ELECT	1uF	20%	50V
C365	1-126-960-11	ELECT	1uF	20%	50V
C366	1-126-960-11	ELECT	1uF	20%	50V
C369	1-126-964-11	ELECT	10uF	20%	50V
C370	1-126-964-11	ELECT	10uF	20%	50V
C371	1-126-964-11	ELECT	10uF	20%	50V
C372	1-126-964-11	ELECT	10uF	20%	50V
C373	1-126-964-11	ELECT	10uF	20%	50V
C374	1-126-960-11	ELECT	1uF	20%	50V
C375	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C377	1-104-664-11	ELECT	47uF	20%	16V
C378	1-126-964-11	ELECT	10uF	20%	50V
C379	1-126-961-11	ELECT	2.2uF	20%	50V
C380	1-126-964-11	ELECT	10uF	20%	50V
C381	1-104-664-11	ELECT	47uF	20%	16V
C383	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C384	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C385	1-104-664-11	ELECT	47uF	20%	16V
C386	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C391	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C398	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C399	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C501	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C502	1-124-589-11	ELECT	47uF	20%	16V
C503	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C504	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C505	1-126-157-11	ELECT	10uF	20%	16V
C506	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C507	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C508	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C509	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C511	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C512	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C513	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C514	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C515	1-124-589-11	ELECT	47uF	20%	16V
C516	1-126-160-11	ELECT	1uF	20%	50V
C517	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C518	1-124-257-00	ELECT	2.2uF	20%	50V
C519	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C520	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C521	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C522	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C523	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C560	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C561	1-126-935-11	ELECT	470uF	20%	6.3V
C563	1-124-589-11	ELECT	47uF	20%	16V
C564	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C621	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C622	1-126-965-11	ELECT	22uF	20%	50V
C623	1-124-589-11	ELECT	47uF	20%	16V
C624	1-124-589-11	ELECT	47uF	20%	16V
C625	1-104-664-11	ELECT	47uF	20%	16V
C626	1-128-131-11	ELECT	22uF	20%	50V
C627	1-128-131-11	ELECT	22uF	20%	50V
C628	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C629	1-126-966-11	ELECT	33uF	20%	16V
C701	1-104-664-11	ELECT	47uF	20%	16V
C704	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C706	1-126-963-11	ELECT	4.7uF	20%	50V
C707	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C709	1-126-933-11	ELECT	100uF	20%	16V
C710	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C712	1-126-933-11	ELECT	100uF	20%	16V
C735	1-126-964-11	ELECT	10uF	20%	50V
C736	1-104-664-11	ELECT	47uF	20%	16V
C801	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C802	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C803	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C804	1-163-091-00	CERAMIC CHIP	8PF		50V
C805	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C806	1-163-087-00	CERAMIC CHIP	4PF		50V
C807	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C808	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C809	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C810	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C811	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C812	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C813	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C814	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C815	1-124-589-11	ELECT	47uF	20%	16V
C816	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C817	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C851	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C852	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C853	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C854	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C855	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C859	1-124-589-11	ELECT	47uF	20%	16V
C980	1-163-038-00	CERAMIC CHIP	0.1uF		25V

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Ref. No.	Part No.	Description			Remarks
C981	1-104-664-11	ELECT	47uF	20%	16V
C982	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C983	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C984	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C985	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C986	1-163-038-00	CERAMIC CHIP	0.1uF		25V
		< PIN JACK >			
CJ570	1-779-011-11	JACK, PIN 6P (LINE-1 IN/LINE OUT)			
		< CONNECTOR >			
CN101	1-779-724-11	CONNECTOR, BOARD TO BOARD 5P			
CN102	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P			
* CN103	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P			
CN162	1-568-845-11	PIN, CONNECTOR (PC BOARD) 31P			
CN163	1-506-469-11	PIN, CONNECTOR 4P			
CN165	1-506-470-11	PIN, CONNECTOR 5P			
CN260	1-766-986-11	CONNECTOR, FFC/FPC 13P			
* CN261	1-560-892-00	PIN, CONNECTOR 4P			
CN301	1-506-471-11	PIN, CONNECTOR 6P			
CN302	1-506-468-11	PIN, CONNECTOR 3P			
* CN341	1-560-891-00	PIN, CONNECTOR 3P			
CN423	1-506-470-11	PIN, CONNECTOR 5P			
CN501	1-506-472-11	PIN, CONNECTOR 7P			
CN603	1-569-337-11	CONNECTOR, BOARD TO BOARD 11P			
		< JACK >			
CNJ980	1-779-013-11	JACK, MINIATURE (CONTROL S IN)			
CNJ981	1-784-598-11	JACK (CONTROL S OUT)			
		< DIODE >			
D103	8-719-048-26	DIODE GL528V1			
D107	8-719-911-19	DIODE 1SS119			
D109	8-719-200-82	DIODE 11ES2			
D161	8-719-200-82	DIODE 11ES2			
D370	8-719-110-08	DIODE RD8.2ES-B2			
D379	8-719-911-19	DIODE 1SS119			
D502	8-719-911-19	DIODE 1SS119			
D503	8-719-911-19	DIODE 1SS119			
D504	8-719-911-19	DIODE 1SS119			
D560	8-719-109-74	DIODE RD4.3ES-B1			
D561	8-719-109-74	DIODE RD4.3ES-B1			
D611	8-719-911-19	DIODE 1SS119			
D612	8-719-109-85	DIODE RD5.1ES-B2			
D614	8-719-911-19	DIODE 1SS119			
D702	8-719-150-92	DIODE RD33EB3T			
D801	8-719-971-05	DIODE HSM123			
D802	8-719-911-19	DIODE 1SS119			
D980	8-719-110-08	DIODE RD8.2ES-B2			
D981	8-719-110-08	DIODE RD8.2ES-B2			
D982	8-719-911-19	DIODE 1SS119			
D983	8-719-110-08	DIODE RD8.2ES-B2			
D984	8-719-110-08	DIODE RD8.2ES-B2			
		< FERRITE BEAD >			
FB981	1-410-397-21	FERRITE BEAD INDUCTOR			
FB982	1-410-397-21	FERRITE BEAD INDUCTOR			

Ref. No.	Part No.	Description	Remarks
		< IC >	
IC100	8-759-702-02	IC NJM062M	
IC101	8-759-481-46	IC LB1943	
IC140	8-759-100-93	IC UPC393G2	
IC141	8-759-438-83	IC BA6305F-E2	
IC161	8-752-895-52	IC CXP87852-044Q	
IC201	8-759-488-74	IC LA71534M-MPB	
IC202	8-759-439-51	IC LC89978M-TE-L	
IC260	8-759-352-17	IC HA118195NT	
IC301	8-759-499-30	IC BA7755AF-E2	
IC340	8-759-486-92	IC LA7256	
IC360	8-759-486-64	IC TDA9615H/N1,557	
IC500	8-759-529-44	IC MB90089PF-G-209-BND-ER	
IC501	8-759-164-09	IC LA7218M	
IC601	8-759-438-18	IC PQ12RD08	
IC733	8-742-037-00	HY B IC SBX1837-51	
IC980	8-759-356-27	IC NJM2129M	
		< JUMPER RESISTOR >	

JR001	1-216-295-00	METAL CHIP	0	5%	1/10W
JR002	1-216-296-00	METAL CHIP	0	5%	1/8W
JR004	1-216-295-00	METAL CHIP	0	5%	1/10W
JR005	1-216-296-00	METAL CHIP	0	5%	1/8W
JR007	1-216-296-00	METAL CHIP	0	5%	1/8W
JR008	1-216-296-00	METAL CHIP	0	5%	1/8W
JR009	1-216-296-00	METAL CHIP	0	5%	1/8W
JR010	1-216-296-00	METAL CHIP	0	5%	1/8W
JR011	1-216-296-00	METAL CHIP	0	5%	1/8W
JR012	1-216-296-00	METAL CHIP	0	5%	1/8W
JR013	1-216-295-00	METAL CHIP	0	5%	1/10W
JR014	1-216-296-00	METAL CHIP	0	5%	1/8W
JR015	1-216-296-00	METAL CHIP	0	5%	1/8W
JR016	1-216-295-00	METAL CHIP	0	5%	1/10W
JR017	1-216-296-00	METAL CHIP	0	5%	1/8W
JR018	1-216-296-00	METAL CHIP	0	5%	1/8W
JR019	1-216-295-00	METAL CHIP	0	5%	1/10W
JR020	1-216-296-00	METAL CHIP	0	5%	1/8W
JR021	1-216-295-00	METAL CHIP	0	5%	1/10W
JR022	1-216-296-00	METAL CHIP	0	5%	1/8W
JR023	1-216-296-00	METAL CHIP	0	5%	1/8W
JR024	1-216-296-00	METAL CHIP	0	5%	1/8W
JR025	1-216-295-00	METAL CHIP	0	5%	1/10W
JR026	1-216-295-00	METAL CHIP	0	5%	1/10W
JR027	1-216-295-00	METAL CHIP	0	5%	1/10W
JR028	1-216-295-00	METAL CHIP	0	5%	1/10W
JR029	1-216-295-00	METAL CHIP	0	5%	1/10W
JR030	1-216-296-00	METAL CHIP	0	5%	1/8W
JR031	1-216-296-00	METAL CHIP	0	5%	1/8W
JR032	1-216-296-00	METAL CHIP	0	5%	1/8W
JR033	1-216-295-00	METAL CHIP	0	5%	1/10W
JR034	1-216-296-00	METAL CHIP	0	5%	1/8W
JR035	1-216-295-00	METAL CHIP	0	5%	1/10W
JR036	1-216-296-00	METAL CHIP	0	5%	1/8W
JR037	1-216-296-00	METAL CHIP	0	5%	1/8W
JR038	1-216-295-00	METAL CHIP	0	5%	1/10W
JR039	1-216-296-00	METAL CHIP	0	5%	1/8W
JR040	1-216-296-00	METAL CHIP	0	5%	1/8W
JR041	1-216-296-00	METAL CHIP	0	5%	1/8W
JR043	1-216-296-00	METAL CHIP	0	5%	1/8W

Ref. No.	Part No.	Description			Remarks
JR044	1-216-296-00	METAL CHIP	0	5%	1/8W
JR045	1-216-296-00	METAL CHIP	0	5%	1/8W
JR047	1-216-296-00	METAL CHIP	0	5%	1/8W
JR048	1-216-296-00	METAL CHIP	0	5%	1/8W
JR049	1-216-296-00	METAL CHIP	0	5%	1/8W
JR050	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L101	1-414-936-21	INDUCTOR	22uH		
L140	1-414-189-31	INDUCTOR	100uH		
L141	1-414-189-31	INDUCTOR	100uH		
L160	1-414-934-21	INDUCTOR	10uH		
L201	1-408-405-00	INDUCTOR	4.7uH		
L204	1-414-940-21	INDUCTOR	100uH		
L207	1-414-931-21	INDUCTOR	3.3uH		
L262	1-414-940-21	INDUCTOR	100uH		
L263	1-414-940-21	INDUCTOR	100uH		
L331	1-414-940-21	INDUCTOR	100uH		
L341	1-414-940-21	INDUCTOR	100uH		
L501	1-414-936-21	INDUCTOR	22uH		
L502	1-414-940-21	INDUCTOR	100uH		
L503	1-414-940-21	INDUCTOR	100uH		
L560	1-414-940-21	INDUCTOR	100uH		
L604	1-410-519-11	INDUCTOR	68uH		
L605	1-414-930-21	INDUCTOR	2.2uH		
L606	1-414-934-21	INDUCTOR	10uH		
L607	1-414-930-21	INDUCTOR	2.2uH		
L703	1-414-930-21	INDUCTOR	2.2uH		
L704	1-414-938-21	INDUCTOR	47uH		
L731	1-414-938-21	INDUCTOR	47uH		
L801	1-410-524-41	INDUCTOR	180uH		
L803	1-414-946-21	INDUCTOR	39uH		
L804	1-414-946-21	INDUCTOR	39uH		
L805	1-414-939-21	INDUCTOR	68uH		
L808	1-414-932-21	INDUCTOR	4.7uH		
		< PHOTO INTERUPTER >			
PH101	8-749-013-23	PHOTO INTERRUPTER GP3S120			
PH102	8-749-013-23	PHOTO INTERRUPTER GP3S120			
		< IC LINK >			
⚠PS101	1-533-586-31	LINK, IC 315mA			
⚠PS600	1-532-841-21	LINK, IC 1.6mA			
⚠PS602	1-532-841-21	LINK, IC 1.6mA			
		< TRANSISTOR >			
Q101	8-729-043-84	TRANSISTOR	PT380F3		
Q102	8-729-043-84	TRANSISTOR	PT380F3		
Q103	8-729-281-53	TRANSISTOR	2SC1815-GR		
Q140	8-729-901-06	TRANSISTOR	DTA144EK		
Q201	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q204	8-729-024-88	TRANSISTOR	MUN2212T1		
Q205	8-729-421-19	TRANSISTOR	UN2213		
Q208	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q209	8-729-216-21	TRANSISTOR	2SA1162-Y		
Q210	8-729-230-49	TRANSISTOR	2SC2712-YG		

Ref. No.	Part No.	Description		Remarks
Q211	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q214	8-729-421-19	TRANSISTOR	UN2213	
Q260	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q301	8-729-281-53	TRANSISTOR	2SC1815-GR	
Q331	8-729-802-91	TRANSISTOR	2SD879	
Q379	8-729-216-22	TRANSISTOR	2SA1162-G	
Q386	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q387	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q502	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q503	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q505	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q560	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q603	8-729-018-99	TRANSISTOR	2SD2394-F	
Q604	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q605	8-729-140-93	TRANSISTOR	2SB733-34	
Q606	8-729-119-78	TRANSISTOR	2SC403SP-51	
Q731	8-729-421-19	TRANSISTOR	UN2213	
Q801	8-729-216-21	TRANSISTOR	2SA1162-Y	
Q802	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q803	8-729-216-21	TRANSISTOR	2SA1162-Y	
Q804	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q805	8-729-900-51	TRANSISTOR	DTA114TK	
Q806	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q807	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q808	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q809	8-729-900-51	TRANSISTOR	DTA114TK	
Q810	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q851	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q852	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q853	8-729-216-21	TRANSISTOR	2SA1162-Y	
Q854	8-729-216-21	TRANSISTOR	2SA1162-Y	
Q855	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q856	8-729-230-49	TRANSISTOR	2SC2712-YG	
Q857	8-729-216-21	TRANSISTOR	2SA1162-Y	

< RESISTOR >

R101	1-249-413-11	CARBON	470	5%	1/4W F
R102	1-216-089-00	METAL CHIP	47K	5%	1/10W
R103	1-249-437-11	CARBON	47K	5%	1/4W
R104	1-216-085-00	METAL CHIP	33K	5%	1/10W
R105	1-216-085-00	METAL CHIP	33K	5%	1/10W
R106	1-249-400-11	CARBON	39	5%	1/4W F
R107	1-249-400-11	CARBON	39	5%	1/4W F
R108	1-249-421-11	CARBON	2.2K	5%	1/4W F
R109	1-216-041-00	METAL CHIP	470	5%	1/10W
R110	1-216-041-00	METAL CHIP	470	5%	1/10W
R111	1-216-041-00	METAL CHIP	470	5%	1/10W
R118	1-216-089-00	METAL CHIP	47K	5%	1/10W
R119	1-216-077-00	METAL CHIP	15K	5%	1/10W
R124	1-249-421-11	CARBON	2.2K	5%	1/4W F
R125	1-249-421-11	CARBON	2.2K	5%	1/4W F
R126	1-247-885-00	CARBON	180K	5%	1/4W
R127	1-249-429-11	CARBON	10K	5%	1/4W
R128	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R129	1-216-073-00	METAL CHIP	10K	5%	1/10W
R130	1-216-073-00	METAL CHIP	10K	5%	1/10W

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

MA-335

Ref. No.	Part No.	Description			Remarks
R131	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R132	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R133	1-249-436-11	CARBON	39K	5%	1/4W
R134	1-216-089-00	METAL CHIP	47K	5%	1/10W
R135	1-216-089-00	METAL CHIP	47K	5%	1/10W
R136	1-216-089-00	METAL CHIP	47K	5%	1/10W
R137	1-216-089-00	METAL CHIP	47K	5%	1/10W
R140	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R141	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R143	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R144	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R145	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R146	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R148	1-249-414-11	CARBON	560	5%	1/4W F
R149	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R150	1-216-049-00	METAL CHIP	1K	5%	1/10W
R151	1-216-037-00	METAL CHIP	330	5%	1/10W
R152	1-216-117-00	METAL CHIP	680K	5%	1/10W
R153	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R154	1-216-111-00	METAL CHIP	390K	5%	1/10W
R155	1-216-105-91	RES,CHIP	220K	5%	1/10W
R160	1-216-077-00	METAL CHIP	15K	5%	1/10W
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W
R162	1-216-089-00	METAL CHIP	47K	5%	1/10W
R163	1-216-073-00	METAL CHIP	10K	5%	1/10W
R164	1-216-073-00	METAL CHIP	10K	5%	1/10W
R165	1-216-295-00	METAL CHIP	0	5%	1/10W
R166	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R167	1-216-097-91	RES,CHIP	100K	5%	1/10W
R168	1-249-417-11	CARBON	1K	5%	1/4W F
R169	1-216-073-00	METAL CHIP	10K	5%	1/10W
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W
R201	1-216-041-00	METAL CHIP	470	5%	1/10W
R202	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R203	1-216-049-00	METAL CHIP	1K	5%	1/10W
R204	1-249-413-11	CARBON	470	5%	1/4W F
R210	1-216-295-00	METAL CHIP	0	5%	1/10W
R212	1-216-073-00	METAL CHIP	10K	5%	1/10W
R213	1-249-429-11	CARBON	10K	5%	1/4W
R218	1-208-798-11	RES,CHIP	4.7K	0.50%	1/10W
R219	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R221	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R222	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R228	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R229	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R230	1-216-045-00	METAL CHIP	680	5%	1/10W
R231	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R232	1-249-420-11	CARBON	1.8K	5%	1/4W F
R234	1-216-049-00	METAL CHIP	1K	5%	1/10W
R235	1-216-295-00	METAL CHIP	0	5%	1/10W
R236	1-216-049-00	METAL CHIP	1K	5%	1/10W
R237	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R238	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R239	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R240	1-216-049-00	METAL CHIP	1K	5%	1/10W
R241	1-216-295-00	METAL CHIP	0	5%	1/10W
R247	1-216-041-00	METAL CHIP	470	5%	1/10W
R260	1-216-044-00	METAL CHIP	620	5%	1/10W
R261	1-216-044-00	METAL CHIP	620	5%	1/10W
R262	1-216-295-00	METAL CHIP	0	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R263	1-216-295-00	METAL CHIP	0	5%	1/10W
R264	1-216-295-00	METAL CHIP	0	5%	1/10W
R265	1-216-295-00	METAL CHIP	0	5%	1/10W
R266	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R267	1-216-073-00	METAL CHIP	10K	5%	1/10W
R268	1-216-081-00	METAL CHIP	22K	5%	1/10W
R269	1-249-421-11	CARBON	2.2K	5%	1/4W F
R270	1-247-863-91	CARBON	22K	5%	1/4W
R271	1-216-049-00	METAL CHIP	1K	5%	1/10W
R272	1-216-077-00	METAL CHIP	15K	5%	1/10W
R273	1-216-077-00	METAL CHIP	15K	5%	1/10W
R274	1-216-073-00	METAL CHIP	10K	5%	1/10W
R275	1-216-073-00	METAL CHIP	10K	5%	1/10W
R276	1-216-049-00	METAL CHIP	1K	5%	1/10W
R301	1-216-093-00	METAL CHIP	68K	5%	1/10W
R302	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R309	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R310	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R311	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R312	1-216-079-00	METAL CHIP	18K	5%	1/10W
R313	1-216-109-00	METAL CHIP	330K	5%	1/10W
R314	1-216-035-00	METAL CHIP	270	5%	1/10W
R315	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R316	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R317	1-216-079-00	METAL CHIP	18K	5%	1/10W
R318	1-216-075-00	METAL CHIP	12K	5%	1/10W
R320	1-216-047-91	RES,CHIP	820	5%	1/10W
R331	1-217-671-11	METAL CHIP	1	5%	1/10W
R332	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R333	1-249-401-11	CARBON	47	5%	1/4W F
R334	1-216-031-00	METAL CHIP	180	5%	1/10W
R341	1-216-049-00	METAL CHIP	1K	5%	1/10W
R342	1-216-049-00	METAL CHIP	1K	5%	1/10W
R344	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R346	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R347	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R348	1-216-033-00	METAL CHIP	220	5%	1/10W
R368	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R370	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R371	1-208-820-11	RES,CHIP	39K	0.50%	1/10W
R372	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R373	1-216-033-00	METAL CHIP	220	5%	1/10W
R374	1-216-033-00	METAL CHIP	220	5%	1/10W
R378	1-249-434-11	CARBON	27K	5%	1/4W
R379	1-216-049-00	METAL CHIP	1K	5%	1/10W
R380	1-216-025-91	RES,CHIP	100	5%	1/10W
R381	1-216-025-91	RES,CHIP	100	5%	1/10W
R382	1-216-295-00	METAL CHIP	0	5%	1/10W
R383	1-216-295-00	METAL CHIP	0	5%	1/10W
R384	1-216-091-00	METAL CHIP	56K	5%	1/10W
R385	1-216-091-00	METAL CHIP	56K	5%	1/10W
R386	1-216-049-00	METAL CHIP	1K	5%	1/10W
R387	1-216-049-00	METAL CHIP	1K	5%	1/10W
R389	1-216-073-00	METAL CHIP	10K	5%	1/10W
R391	1-216-049-00	METAL CHIP	1K	5%	1/10W
R392	1-216-049-00	METAL CHIP	1K	5%	1/10W
R393	1-216-295-00	METAL CHIP	0	5%	1/10W
R502	1-216-033-00	METAL CHIP	220	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R505	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R506	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R507	1-216-081-00	METAL CHIP	22K	5%	1/10W
R508	1-216-049-00	METAL CHIP	1K	5%	1/10W
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W
R514	1-216-073-00	METAL CHIP	10K	5%	1/10W
R515	1-216-101-00	METAL CHIP	150K	5%	1/10W
R517	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R518	1-216-043-91	RES,CHIP	560	5%	1/10W
R519	1-216-043-91	RES,CHIP	560	5%	1/10W
R520	1-216-033-00	METAL CHIP	220	5%	1/10W
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W
R522	1-216-073-00	METAL CHIP	10K	5%	1/10W
R523	1-216-073-00	METAL CHIP	10K	5%	1/10W
R560	1-216-022-00	METAL CHIP	75	5%	1/10W
R561	1-216-021-00	METAL CHIP	68	5%	1/10W
R562	1-249-407-11	CARBON	150	5%	1/4W F
R563	1-249-407-11	CARBON	150	5%	1/4W F
R565	1-216-037-00	METAL CHIP	330	5%	1/10W
R617	1-249-417-11	CARBON	1K	5%	1/4W F
R621	1-216-089-00	METAL CHIP	47K	5%	1/10W
R622	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R623	1-247-843-11	CARBON	3.3K	5%	1/4W
R624	1-216-430-11	METAL OXIDE	390	5%	1W F
R625	1-249-429-11	CARBON	10K	5%	1/4W
R626	1-249-417-11	CARBON	1K	5%	1/4W F
R627	1-247-815-91	CARBON	220	5%	1/4W
R628	1-247-815-91	CARBON	220	5%	1/4W
R701	1-216-049-00	METAL CHIP	1K	5%	1/10W
R702	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R705	1-212-893-00	FUSIBLE	330	5%	1/4W F
R706	1-216-113-00	METAL CHIP	470K	5%	1/10W
R709	1-216-295-00	METAL CHIP	0	5%	1/10W
R710	1-216-295-00	METAL CHIP	0	5%	1/10W
R711	1-216-295-00	METAL CHIP	0	5%	1/10W
R712	1-216-295-00	METAL CHIP	0	5%	1/10W
R731	1-216-049-00	METAL CHIP	1K	5%	1/10W
R732	1-216-049-00	METAL CHIP	1K	5%	1/10W
R733	1-249-425-11	CARBON	4.7K	5%	1/4W F
R735	1-216-049-00	METAL CHIP	1K	5%	1/10W
R736	1-216-295-00	METAL CHIP	0	5%	1/10W
R737	1-216-081-00	METAL CHIP	22K	5%	1/10W
R738	1-216-081-00	METAL CHIP	22K	5%	1/10W
R739	1-249-429-11	CARBON	10K	5%	1/4W
R748	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R749	1-216-049-00	METAL CHIP	1K	5%	1/10W
R801	1-216-049-00	METAL CHIP	1K	5%	1/10W
R802	1-216-049-00	METAL CHIP	1K	5%	1/10W
R803	1-216-039-00	METAL CHIP	390	5%	1/10W
R804	1-216-039-00	METAL CHIP	390	5%	1/10W
R805	1-216-049-00	METAL CHIP	1K	5%	1/10W
R806	1-216-043-91	RES,CHIP	560	5%	1/10W
R807	1-216-039-00	METAL CHIP	390	5%	1/10W
R808	1-216-033-00	METAL CHIP	220	5%	1/10W
R809	1-216-077-00	METAL CHIP	15K	5%	1/10W
R810	1-216-075-00	METAL CHIP	12K	5%	1/10W
R811	1-216-033-00	METAL CHIP	220	5%	1/10W
R812	1-216-043-91	RES,CHIP	560	5%	1/10W
R813	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R814	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R815	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R816	1-216-075-00	METAL CHIP	12K	5%	1/10W
R817	1-216-077-00	METAL CHIP	15K	5%	1/10W
R818	1-216-039-00	METAL CHIP	390	5%	1/10W
R819	1-216-045-00	METAL CHIP	680	5%	1/10W
R820	1-216-039-00	METAL CHIP	390	5%	1/10W
R821	1-216-045-00	METAL CHIP	680	5%	1/10W
R822	1-216-049-00	METAL CHIP	1K	5%	1/10W
R823	1-216-041-00	METAL CHIP	470	5%	1/10W
R824	1-216-047-91	RES,CHIP	820	5%	1/10W
R825	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R826	1-216-025-91	RES,CHIP	100	5%	1/10W
R827	1-216-045-00	METAL CHIP	680	5%	1/10W
R828	1-216-043-91	RES,CHIP	560	5%	1/10W
R838	1-249-410-11	CARBON	270	5%	1/4W F
R844	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R851	1-208-820-11	RES,CHIP	39K	0.50%	1/10W
R852	1-208-802-11	RES,CHIP	6.8K	0.50%	1/10W
R853	1-208-792-11	RES,CHIP	2.7K	0.50%	1/10W
R855	1-208-770-11	RES,CHIP	330	0.50%	1/10W
R856	1-208-758-11	RES,CHIP	100	0.50%	1/10W
R857	1-208-790-11	RES,CHIP	2.2K	0.50%	1/10W
R858	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R859	1-208-800-11	RES,CHIP	5.6K	0.50%	1/10W
R860	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R861	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R862	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R864	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R865	1-216-107-00	METAL CHIP	270K	5%	1/10W
R980	1-216-049-00	METAL CHIP	1K	5%	1/10W
R981	1-216-295-00	METAL CHIP	0	5%	1/10W

< VARIABLE RESISTOR >

RV731	1-241-766-11	RES, ADJ, CERMET 47K

< SWITCH >

S101	1-762-108-11	SWITCH, PUSH (1 KEY)(REC PROOF)
S102	1-771-155-11	SWITCH, ROTARY (MECHANISM MODE)
S102	1-771-394-11	SWITCH, ROTARY (MECHANISM MODE)
S701	1-571-588-11	SWITCH, SLIDE (RF NUIT CH3/CH4)

< TRANSFORMER >

T331	1-431-097-11	TRANSFORMER, BIAS OSCILLATION

< TUNER >

TU700	8-598-289-00	TUNER, FSS BTF-MA401

< VIBRATOR >

X160	1-760-494-11	VIBRATOR, CRYSTAL 16MHz
X202	1-577-380-11	VIBRATOR, CRYSTAL 3.579545MHz
X500	1-577-381-11	VIBRATOR, CRYSTAL 14.31818MHz
X501	1-577-165-11	VIBLATOR, CERAMIC 503.5kHz

MG-21

Ref. No.	Part No.	Description			Remarks
*	A-6791-609-A	MG-21 BOARD, COMPLETE			
		**********			
					(Ref.No.:3,000 Series)
		< CAPACITOR >			
C002	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C006	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C007	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C008	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C009	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C010	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C011	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C012	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C013	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C015	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C016	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C017	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C018	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C020	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C021	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C022	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C023	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C024	1-124-234-00	ELECT	22uF	20%	16V
C026	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C027	1-124-589-11	ELECT	47uF	20%	16V
C029	1-124-234-00	ELECT	22uF	20%	16V
C030	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C032	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C034	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C035	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C036	1-128-057-11	ELECT	330uF	20%	6.3V
C037	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C038	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C039	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C041	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C045	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C046	1-124-234-00	ELECT	22uF	20%	16V
C047	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C048	1-124-234-00	ELECT	22uF	20%	16V
C049	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C050	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C051	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C301	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C302	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C303	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C304	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C305	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C306	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C307	1-124-234-00	ELECT	22uF	20%	16V
C308	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C309	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C310	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C311	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C312	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C313	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C314	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C315	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C316	1-124-584-00	ELECT	100uF	20%	10V
C317	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C318	1-126-919-11	ELECT	6800uF	20%	6.3V
C319	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C320	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C321	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C329	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C330	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C341	1-126-157-11	ELECT	10uF	20%	16V
C342	1-126-157-11	ELECT	10uF	20%	16V
C343	1-126-157-11	ELECT	10uF	20%	16V
C344	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C351	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C352	1-124-234-00	ELECT	22uF	20%	16V
C353	1-126-157-11	ELECT	10uF	20%	16V
C356	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C357	1-126-160-11	ELECT	1uF	20%	50V
C401	1-128-057-11	ELECT	330uF	20%	6.3V
C402	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C403	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C404	1-128-057-11	ELECT	330uF	20%	6.3V
C405	1-110-489-11	CAPACITOR	1F		5.5V
C407	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C408	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C409	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C501	1-124-589-11	ELECT	47uF	20%	16V
C502	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C503	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C510	1-126-157-11	ELECT	10uF	20%	16V
C511	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C512	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C513	1-126-160-11	ELECT	1uF	20%	50V
C514	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C515	1-126-157-11	ELECT	10uF	20%	16V
C516	1-126-160-11	ELECT	1uF	20%	50V
C517	1-126-154-11	ELECT	47uF	20%	6.3V
C518	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C519	1-124-584-00	ELECT	100uF	20%	10V
C522	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C523	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C524	1-124-259-11	ELECT	4.7uF	20%	16V
C525	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C526	1-124-259-11	ELECT	4.7uF	20%	16V
C528	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C529	1-126-160-11	ELECT	1uF	20%	50V
C530	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C532	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C533	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C534	1-126-157-11	ELECT	10uF	20%	16V
C535	1-126-157-11	ELECT	10uF	20%	16V
		< CONNECTOR >			
CN001	1-506-468-11	PIN, CONNECTOR 3P			
CN002	1-506-468-11	PIN, CONNECTOR 3P			
CN003	1-506-470-11	PIN, CONNECTOR 5P			
CN004	1-568-828-11	PIN, CONNECTOR (PC BOARD) 9P			
CN301	1-506-472-11	PIN, CONNECTOR 7P			
		< JACK >			
CNJ001	1-784-598-11	JACK (CPD IN)			
CNJ301	1-784-598-11	JACK (G-LINK)			

Ref. No.	Part No.	Description	Remarks
		< DIODE >	
D001	8-719-404-49	DIODE MA111	
D002	8-719-404-49	DIODE MA111	
D003	8-719-404-49	DIODE MA111	
D004	8-719-404-49	DIODE MA111	
D005	8-719-404-49	DIODE MA111	
D007	8-719-420-14	DIODE MA8082-M	
D008	8-719-404-49	DIODE MA111	
D303	8-719-420-51	DIODE MA729	
D304	8-719-404-49	DIODE MA111	
D305	8-719-420-14	DIODE MA8082-M	
D306	8-719-404-49	DIODE MA111	
D351	8-719-404-49	DIODE MA111	
D401	8-719-023-31	DIODE MA720	
D402	8-719-420-51	DIODE MA729	
D403	8-719-023-31	DIODE MA720	
D404	8-719-420-51	DIODE MA729	
		< DELAY LINE >	
DL501	1-411-526-11	DELAY LINE (400 NS)	
DL502	1-411-526-11	DELAY LINE (400 NS)	
		< FERRITE BEAD >	
FB001	1-414-234-11	INDUCTOR CHIP 0UH	
FB002	1-414-234-11	INDUCTOR CHIP 0UH	
FB003	1-414-234-11	INDUCTOR CHIP 0UH	
FB004	1-414-234-11	INDUCTOR CHIP 0UH	
FB005	1-414-234-11	INDUCTOR CHIP 0UH	
FB006	1-414-233-21	INDUCTOR CHIP 0UH	
FB007	1-414-233-21	INDUCTOR CHIP 0UH	
FB008	1-414-233-21	INDUCTOR CHIP 0UH	
FB009	1-414-233-21	INDUCTOR CHIP 0UH	
FB010	1-414-234-11	INDUCTOR CHIP 0UH	
FB011	1-414-234-11	INDUCTOR CHIP 0UH	
FB012	1-414-234-11	INDUCTOR CHIP 0UH	
FB014	1-414-234-11	INDUCTOR CHIP 0UH	
FB015	1-414-234-11	INDUCTOR CHIP 0UH	
FB020	1-414-235-11	INDUCTOR CHIP 0UH	
FB021	1-414-235-11	INDUCTOR CHIP 0UH	
FB022	1-414-235-11	INDUCTOR CHIP 0UH	
FB023	1-414-235-11	INDUCTOR CHIP 0UH	
FB024	1-414-235-11	INDUCTOR CHIP 0UH	
		< FILTER >	
FL301	1-233-319-11	FERRITE 0UH	
FL401	1-233-319-11	FERRITE 0UH	
FL402	1-233-319-11	FERRITE 0UH	
		< IC >	
IC001	8-759-100-93	IC UPC393G2	
IC002	8-759-531-73	IC CXD8753Q	
IC003	8-752-891-17	IC CXP84632-014Q	
IC301	8-759-535-81	IC LC27016B-MF2	
IC311	8-759-008-74	IC MC14001BF	
IC331	8-759-710-07	IC NJM2234M	
IC373	8-759-252-54	IC S-80745SL-A9-T1	
IC401	8-759-535-83	IC MX23C4000PC-12-GP1	
IC402	8-759-535-82	IC MSM514260CSL-60JSDR1	
IC501	8-759-182-84	IC PQ05SZ5U	
IC502	8-759-351-44	IC MC1378FNR2	
		< JUMPER >	
JS001	1-216-295-00	METAL CHIP 0 5% 1/10W	
		< COIL >	
L002	1-414-934-21	INDUCTOR 10uH	
L003	1-414-934-21	INDUCTOR 10uH	
L006	1-414-934-21	INDUCTOR 10uH	
L007	1-414-934-21	INDUCTOR 10uH	
L008	1-414-940-21	INDUCTOR 100uH	
L009	1-414-936-21	INDUCTOR 22uH	
L010	1-414-936-21	INDUCTOR 22uH	
L301	1-414-938-21	INDUCTOR 47uH	
L351	1-414-940-21	INDUCTOR 100uH	
L401	1-414-934-21	INDUCTOR 10uH	
L402	1-414-934-21	INDUCTOR 10uH	
L501	1-411-476-11	COIL, VARIABLE	
L502	1-414-940-21	INDUCTOR 100uH	
L503	1-414-932-21	INDUCTOR 4.7uH	
		< IC LINK >	
⚠PS001	1-533-901-11	LINK, IC 125mA	
⚠PS002	1-533-587-21	LINK, IC 400mA	
		< TRANSISTOR >	
Q001	8-729-044-60	TRANSISTOR 2SC3383-T-AA	
Q002	8-729-044-60	TRANSISTOR 2SC3383-T-AA	
Q003	8-729-421-19	TRANSISTOR UN2213	
Q004	8-729-010-25	TRANSISTOR MSD601-RT1	
Q005	8-729-010-25	TRANSISTOR MSD601-RT1	
Q006	8-729-010-25	TRANSISTOR MSD601-RT1	
Q007	8-729-010-25	TRANSISTOR MSD601-RT1	
Q008	8-729-044-60	TRANSISTOR 2SC3383-T-AA	
Q009	8-729-421-19	TRANSISTOR UN2213	
Q010	8-729-421-19	TRANSISTOR UN2213	
Q011	8-729-044-60	TRANSISTOR 2SC3383-T-AA	
Q012	8-729-421-19	TRANSISTOR UN2213	
Q015	8-729-421-19	TRANSISTOR UN2213	
Q016	8-729-010-05	TRANSISTOR MSB709-RT1	
Q017	8-729-010-05	TRANSISTOR MSB709-RT1	
Q018	8-729-010-05	TRANSISTOR MSB709-RT1	
Q019	8-729-010-05	TRANSISTOR MSB709-RT1	
Q302	8-729-010-25	TRANSISTOR MSD601-RT1	
Q351	8-729-010-05	TRANSISTOR MSB709-RT1	
Q352	8-729-010-05	TRANSISTOR MSB709-RT1	
Q353	8-729-010-05	TRANSISTOR MSB709-RT1	
Q354	8-729-010-05	TRANSISTOR MSB709-RT1	
Q505	8-729-010-05	TRANSISTOR MSB709-RT1	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

MG-21

< RESISTOR >

Ref. No.	Part No.	Description			Remarks
R002	1-249-402-11	CARBON	56	5%	1/4W F
R004	1-216-049-00	METAL CHIP	1K	5%	1/10W
R005	1-216-049-00	METAL CHIP	1K	5%	1/10W
R007	1-249-398-11	CARBON	27	5%	1/4W F
R008	1-216-049-00	METAL CHIP	1K	5%	1/10W
R009	1-216-295-00	METAL CHIP	0	5%	1/10W
R010	1-216-049-00	METAL CHIP	1K	5%	1/10W
R011	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R012	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R013	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R014	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R015	1-216-025-91	RES,CHIP	100	5%	1/10W
R016	1-216-089-00	METAL CHIP	47K	5%	1/10W
R017	1-216-081-00	METAL CHIP	22K	5%	1/10W
R018	1-216-025-91	RES,CHIP	100	5%	1/10W
R019	1-216-089-00	METAL CHIP	47K	5%	1/10W
R020	1-216-081-00	METAL CHIP	22K	5%	1/10W
R022	1-216-049-00	METAL CHIP	1K	5%	1/10W
R023	1-216-017-91	RES,CHIP	47	5%	1/10W
R024	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R025	1-216-049-00	METAL CHIP	1K	5%	1/10W
R027	1-249-402-11	CARBON	56	5%	1/4W F
R029	1-216-295-00	METAL CHIP	0	5%	1/10W
R030	1-216-017-91	RES,CHIP	47	5%	1/10W
R031	1-216-073-00	METAL CHIP	10K	5%	1/10W
R032	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R033	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R035	1-249-398-11	CARBON	27	5%	1/4W F
R036	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R037	1-216-295-00	METAL CHIP	0	5%	1/10W
R038	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R039	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R040	1-216-121-91	RES,CHIP	1M	5%	1/10W
R046	1-216-295-00	METAL CHIP	0	5%	1/10W
R048	1-216-089-00	METAL CHIP	47K	5%	1/10W
R051	1-216-045-00	METAL CHIP	680	5%	1/10W
R053	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R054	1-216-025-91	RES,CHIP	100	5%	1/10W
R057	1-216-025-91	RES,CHIP	100	5%	1/10W
R058	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R060	1-216-045-00	METAL CHIP	680	5%	1/10W
R061	1-216-045-00	METAL CHIP	680	5%	1/10W
R063	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R064	1-216-025-91	RES,CHIP	100	5%	1/10W
R067	1-216-025-91	RES,CHIP	100	5%	1/10W
R068	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R070	1-216-045-00	METAL CHIP	680	5%	1/10W
R071	1-216-041-00	METAL CHIP	470	5%	1/10W
R072	1-216-041-00	METAL CHIP	470	5%	1/10W
R073	1-216-041-00	METAL CHIP	470	5%	1/10W
R074	1-216-041-00	METAL CHIP	470	5%	1/10W
R081	1-216-089-00	METAL CHIP	47K	5%	1/10W
R082	1-216-089-00	METAL CHIP	47K	5%	1/10W
R083	1-216-043-91	RES,CHIP	560	5%	1/10W
R084	1-216-295-00	METAL CHIP	0	5%	1/10W
R085	1-216-295-00	METAL CHIP	0	5%	1/10W
R086	1-216-295-00	METAL CHIP	0	5%	1/10W
R087	1-216-295-00	METAL CHIP	0	5%	1/10W
R088	1-216-295-00	METAL CHIP	0	5%	1/10W
R089	1-216-295-00	METAL CHIP	0	5%	1/10W
R090	1-216-295-00	METAL CHIP	0	5%	1/10W
R091	1-216-295-00	METAL CHIP	0	5%	1/10W
R301	1-216-073-00	METAL CHIP	10K	5%	1/10W
R302	1-216-073-00	METAL CHIP	10K	5%	1/10W
R303	1-216-073-00	METAL CHIP	10K	5%	1/10W
R304	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-073-00	METAL CHIP	10K	5%	1/10W
R308	1-216-073-00	METAL CHIP	10K	5%	1/10W
R309	1-216-073-00	METAL CHIP	10K	5%	1/10W
R310	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R311	1-216-083-00	METAL CHIP	27K	5%	1/10W
R312	1-216-075-00	METAL CHIP	12K	5%	1/10W
R313	1-216-037-00	METAL CHIP	330	5%	1/10W
R314	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R315	1-216-025-91	RES,CHIP	100	5%	1/10W
R317	1-216-121-91	RES,CHIP	1M	5%	1/10W
R318	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R319	1-216-295-00	METAL CHIP	0	5%	1/10W
R320	1-216-304-11	METAL CHIP	3.3	5%	1/10W
R321	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R322	1-216-035-00	METAL CHIP	270	5%	1/10W
R324	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R331	1-216-043-91	RES,CHIP	560	5%	1/10W
R341	1-216-295-00	METAL CHIP	0	5%	1/10W
R351	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R352	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R353	1-216-295-00	METAL CHIP	0	5%	1/10W
R354	1-216-049-00	METAL CHIP	1K	5%	1/10W
R355	1-216-081-00	METAL CHIP	22K	5%	1/10W
R356	1-216-089-00	METAL CHIP	47K	5%	1/10W
R357	1-216-295-00	METAL CHIP	0	5%	1/10W
R358	1-216-019-00	METAL CHIP	56	5%	1/10W
R359	1-216-047-91	RES,CHIP	820	5%	1/10W
R360	1-216-043-91	RES,CHIP	560	5%	1/10W
R361	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R364	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R366	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R367	1-216-104-00	METAL CHIP	200K	5%	1/10W
R369	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R371	1-216-060-00	RES,CHIP	3K	5%	1/10W
R402	1-216-097-00	METAL CHIP	100K	5%	1/10W
R403	1-216-097-00	METAL CHIP	100K	5%	1/10W
R404	1-216-097-00	METAL CHIP	100K	5%	1/10W
R405	1-216-097-00	METAL CHIP	100K	5%	1/10W
R406	1-216-097-00	METAL CHIP	100K	5%	1/10W
R407	1-216-097-00	METAL CHIP	100K	5%	1/10W
R408	1-216-097-00	METAL CHIP	100K	5%	1/10W
R409	1-216-097-00	METAL CHIP	100K	5%	1/10W
R410	1-216-097-00	METAL CHIP	100K	5%	1/10W
R411	1-216-097-00	METAL CHIP	100K	5%	1/10W
R412	1-216-097-00	METAL CHIP	100K	5%	1/10W
R413	1-216-097-00	METAL CHIP	100K	5%	1/10W
R414	1-216-097-00	METAL CHIP	100K	5%	1/10W
R415	1-216-097-00	METAL CHIP	100K	5%	1/10W
R416	1-216-097-00	METAL CHIP	100K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R417	1-216-097-00	METAL CHIP	100K	5%	1/10W
R418	1-216-097-00	METAL CHIP	100K	5%	1/10W
R419	1-216-097-00	METAL CHIP	100K	5%	1/10W
R420	1-216-097-00	METAL CHIP	100K	5%	1/10W
R421	1-216-097-00	METAL CHIP	100K	5%	1/10W
R422	1-216-097-00	METAL CHIP	100K	5%	1/10W
R423	1-216-097-00	METAL CHIP	100K	5%	1/10W
R424	1-216-097-00	METAL CHIP	100K	5%	1/10W
R425	1-216-097-00	METAL CHIP	100K	5%	1/10W
R426	1-216-097-00	METAL CHIP	100K	5%	1/10W
R430	1-216-097-00	METAL CHIP	100K	5%	1/10W
R431	1-216-097-00	METAL CHIP	100K	5%	1/10W
R502	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R503	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R504	1-216-295-00	METAL CHIP	0	5%	1/10W
R505	1-216-295-00	METAL CHIP	0	5%	1/10W
R506	1-216-295-00	METAL CHIP	0	5%	1/10W
R509	1-216-295-00	METAL CHIP	0	5%	1/10W
R512	1-216-101-00	METAL CHIP	150K	5%	1/10W
R513	1-216-295-00	METAL CHIP	0	5%	1/10W
R514	1-216-101-00	METAL CHIP	150K	5%	1/10W
R515	1-216-295-00	METAL CHIP	0	5%	1/10W
R517	1-216-033-00	METAL CHIP	220	5%	1/10W
R518	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R519	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R520	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R521	1-216-295-00	METAL CHIP	0	5%	1/10W
R522	1-216-295-00	METAL CHIP	0	5%	1/10W
R523	1-216-041-00	METAL CHIP	470	5%	1/10W
R524	1-216-109-00	METAL CHIP	330K	5%	1/10W
R525	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R526	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R527	1-216-121-91	RES,CHIP	1M	5%	1/10W
R528	1-216-041-00	METAL CHIP	470	5%	1/10W
R529	1-216-121-91	RES,CHIP	1M	5%	1/10W
R530	1-216-121-91	RES,CHIP	1M	5%	1/10W
R531	1-216-083-00	METAL CHIP	27K	5%	1/10W
R532	1-216-049-00	METAL CHIP	1K	5%	1/10W
		< VIBRATOR >			
X001	1-767-914-21	VIBRATOR, CRYSTAL 13.56MHz			
X301	1-767-915-21	VIBRATOR, CRYSTAL 4.02797MHz			
X501	1-567-878-11	OSCILLATOR, CRYSTAL 14.31818MHz			
X502	1-760-798-11	VIBRATOR, CERAMIC 4.03MHz			
⚠	1-468-308-11	POWER BLOCK SR821			
		**********			
		(Ref. No.: 9,000 Series)			
		< CAPACITOR >			
⚠C101	1-104-705-51	FILM	0.1uF		250V
⚠C102	1-104-705-51	FILM	0.1uF		250V
C106	1-119-882-41	ELECT	120uF		200V
C107	1-126-963-11	ELECT	4.7uF		50V
C110	1-130-491-51	FILM	0.047uF		50V
C111	1-130-491-51	FILM	0.047uF		50V
C201	1-126-967-11	ELECT	47uF		50V
C202	1-126-183-11	ELECT	1000uF		16V
C203	1-126-934-11	ELECT	220uF		16V
C204	1-111-044-11	ELECT	2200uF		16V
C205	1-126-925-11	ELECT	470uF		10V
C206	1-126-967-11	ELECT	47uF		50V
C207	1-126-925-11	ELECT	470uF		10V
C208	1-126-960-11	ELECT	1uF		50V
		< DIODE >			
D103	8-719-920-32	DIODE ERA15-02			
D104	8-719-109-61	DIODE RD3.0ES			
D105	8-719-911-19	DIODE 1SS119			
D106	8-719-904-05	DIODE 1N4005			
D107	8-719-904-05	DIODE 1N4005			
D108	8-719-904-05	DIODE 1N4005			
D109	8-719-904-05	DIODE 1N4005			
D110	8-719-904-05	DIODE 1N4005			
D201	8-719-061-02	DIODE PR1003			
D202	8-719-510-73	DIODE S3L20U			
D204	8-719-027-20	DIODE D3S4M			
D205	8-719-058-08	DIODE RD51F			
D206	8-719-061-02	DIODE PR1003			
D207	8-719-061-02	DIODE PR1003			
		< FUSE >			
⚠F101	1-533-296-11	FUSE	2A		125V
		< FERRITE BEAD >			
FB1	9-902-053-01	FERRITE BEAD			
		< IC >			
⚠IC201	8-759-420-19	IC AN1431T			
		< PHOTOCOUPLER >			
⚠PC101	8-719-018-29	PHOTOCOUPLER ON3131			
		< TRANSISTOR >			
Q101	8-729-904-98	TRANSISTOR 2SC4054			
Q102	8-729-012-31	TRANSISTOR 2SC4040			
		< RESISTOR >			
⚠R101	1-219-779-51	CARBON	6.8M	10%	1/2W
		MISCELLANEOUS			
		**********			
⚠9	1-783-605-11	CORD, POWER			
11	1-762-844-21	SWITCH, ROTARY			
14	1-783-515-11	CABLE, FLAT (FFM-23)			
16	1-783-547-11	CABLE, FLAT (FFM-25)			
⚠54	1-468-308-11	POWER BLOCK			
56	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P			
704	1-500-144-11	HEAD, FE			
M902	1-698-971-11	MOTOR, DC (SPINDLE)			
M903	X-3947-577-1	MOTOR ASSY, CAM			

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remarks
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-475-749-21	COMMANDER, STANDARD (RMT-V250)	
	1-775-454-21	CORD, CONNECTION (MONAURAL CABLE)	
	1-776-258-11	CORD, AVC CONNECTION (FOR VIDEO/AUDIO)	
	1-696-592-11	CORD, CONNECTION (NTSC)(FOR RF)1.5m	
	1-783-325-11	CORD, CONNECTION (CABLE MOUSE)	
	3-709-044-01	COVER, BATTERY	
	3-861-574-11	MANUAL, INSTRUCTION (ENGLISH)	
	3-861-574-21	MANUAL, INSTRUCTION (FRENCH)(CND)	
	3-972-850-01	BUTTON, FUNCTION	
	3-973-077-31	RING, CHANGE SPEED	
*	3-979-317-01	CUSHION	
*	3-979-512-01	SPACER	
*	3-987-412-11	INDIVIDUAL CARTON	

Ref. No.	Part No.	Description	Remarks
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3	
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#701	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#702	7-682-547-04	SCREW +P 3X6	
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	

9-921-691-11

Sony Corporation
Home A&V Products Company

98G1637-1
Printed in Japan © 1998.7
Published by Quality Assurance Dept.
(Osaki East)